Sub-strand B. Algebra (Algebraic Thinking)

III.B.1 – Students will translate among equivalent forms of expressions.

III.B.2 – Students will understand the relationship between absolute value and distance on the number line. Students will graph simple expressions involving absolute value.

III.B.3 – Students will find equations of a line.

III.B.4 – Students will translate among equivalent forms of linear equations and inequalities.

III.B.5 – Students will use a variety of models to represent functions and patterns in real-world and mathematical problems.

III.B.6 – Students will apply the laws of exponents to perform operations on expressions with integer exponents.

III.B.7 – Students will solve linear equations and inequalities in one variable with numeric, graphic and symbolic methods.

III.B.8 – Students will determine solutions to quadratic equations in one variable with numeric, graphic and symbolic methods.

III.B.9 – Students will use appropriate terminology and mathematical notation to define and represent recursion.

III.B.10 – Students will create and use recursive formulas to model and solve real-world and mathematical problems.

III.B.11 – Students will solve systems of two linear equations and inequalities with 2 variables using numeric, graphic and symbolic methods.

III.B.12 – Students will understand how slopes can be used to determine whether lines are parallel or perpendicular and determine equations for parallel lines and perpendicular lines.

III.B.G13 – Students will use formulas with more than one variable to solve real-world and mathematical problems.

Strand IV – Data Analysis, Statistics and Probability

Sub-strand A. Data and Statistics

IV.A.1 – Students will analyze graphs and demonstrate understanding of the strengths and weaknesses of each format by choosing appropriately among them for a given situation.

IV.A.2 – Students will use measures of central tendency and variability to describe, compare and draw conclusions about sets of data.

IV.A.3 – Students will determine approximate line of best-fit and use the line to draw conclusions.

IV.A.4 – Students will know the influence of outliers on various measures and representations of data about real- world and mathematical problems.

IV.A.5 – Students will distinguish between correlation and causation.

IV.A.6 – Students will interpret data credibility in the context of measurement error and display distortion.

IV.A.7 – Students will compare outcomes of voting methods.

IV.A.G8 – Students will analyze histograms, bar graphs, circle graphs, stem-and-leaf plots and box-and-whisker plots.

IV.A.G9 – Students will understand the meaning of and be able to compute minimum, maximum, range, median, mean and mode of a data set.

Diagnostic Test

Pages 1–19

Segment 1

1. C 3. A 5. D 7. B 9. C 11. D 13. B 15. D 17. B 19. C

2. D 4. C 6. B 8. C 10. A 12. B 14. D 16. B 18. D

20.(A)

Girls		Boys
3 1 0	15	1
8 6 4	16	2
5 4 1 0	17	6 6 8
2 2	18	1 3 5 7 7
	19	4 8

2 | 18 = 182 cm 19 | 8 = 198 cm

(B) The median height of the girls in the sample is 169 cm. Half of the 300 girls in the school would be expected to have heights of 169 cm or more.
$300 \div 2 = 150$ Approximate number of girls = 150 girls

Segment 2

21. A 23. A 25. A 27. B 29. C 31. D 33. C 35. D 37. A 39. 36

22. B 24. A 26. C 28. D 30. C 32. C 34. A 36. A 38. B

40. First, find the rate of the ball in feet per second.

$$\frac{2 \text{ revolutions}}{1 \text{ second}} = \frac{2\,(2\pi r \text{ feet})}{1 \text{ second}} = \frac{2\,(2)\,(3.14)\,(1 \text{ foot})}{1 \text{ second}} = \frac{12.56 \text{ feet}}{1 \text{ second}} = 12.56 \text{ ft/sec}$$

Next, convert feet per second to miles per hour.

$$\frac{12.56 \text{ ft}}{1 \text{ sec}} \times \frac{1 \text{ mi}}{5280 \text{ ft}} \times \frac{60 \text{ sec}}{1 \text{ min}} \times \frac{60 \text{ min}}{1 \text{ hr}} = \frac{8.56 \text{ mi}}{1 \text{ hr}}$$

Speed = 8.56 miles/hour

Segment 3

41. A 43. A 45. C 47. B 49. C 51. B 53. B 55. A 57. D 59. 10

42. C 44. A 46. D 48. A 50. C 52. B 54. B 56. C 58. A

60.(A) The Pythagorean theorem $c^2 = a^2 + b^2$ may be used to find the hypotenuse (c) of the right triangle from the length of the two legs (a and b).

(B) $c^2 = a^2 + b^2$
$c^2 = 105^2 + 130^2$

(C) $c^2 = a^2 + b^2$
$c^2 = 105^2 + 130^2$
$c^2 = 27,925$
$\sqrt{c^2} = \sqrt{27,925}$
$c = 167.1$ Distance $= 167.1$ yards

Page 22 Least Common Multiple

1. 30
2. 48
3. 36
4. 21
5. 24
6. 24
7. 28
8. 18
9. 30
10. 42
11. 36
12. 35
13. 90
14. 24
15. 36
16. 45
17. 15
18. 44

Pages 22–23 Fraction Review

1. $5\frac{1}{2}$
2. $2\frac{2}{3}$
3. $2\frac{1}{4}$
4. $2\frac{2}{9}$
5. 4
6. $4\frac{1}{5}$
7. $3\frac{1}{4}$
8. 6
9. 3
10. $2\frac{4}{7}$
11. $2\frac{1}{2}$
12. $3\frac{2}{3}$
13. $\frac{17}{8}$
14. $\frac{33}{4}$
15. $\frac{14}{3}$
16. $\frac{28}{3}$
17. $\frac{47}{5}$
18. $\frac{27}{4}$
19. $\frac{44}{7}$
20. $\frac{11}{4}$
21. $\frac{21}{8}$
22. $\frac{19}{2}$
23. $\frac{73}{9}$
24. $\frac{51}{7}$
25. $\frac{1}{4}$
26. $\frac{2}{3}$
27. $\frac{1}{3}$
28. $\frac{1}{4}$
29. $\frac{5}{6}$
30. $\frac{4}{5}$
31. $\frac{1}{3}$
32. $\frac{1}{3}$
33. $\frac{1}{2}$
34. $\frac{4}{7}$
35. $\frac{3}{7}$
36. $\frac{1}{4}$
37. $9\frac{1}{8}$
38. $11\frac{7}{8}$
39. $14\frac{1}{4}$
40. $4\frac{11}{12}$
41. $11\frac{1}{12}$
42. $3\frac{3}{4}$
43. $3\frac{13}{20}$
44. $1\frac{3}{8}$
45. $2\frac{7}{12}$
46. $6\frac{1}{40}$
47. 75
48. 32
49. $\frac{7}{12}$
50. $5\frac{1}{2}$
51. 49
52. $11\frac{2}{3}$
53. 69
54. $3\frac{3}{4}$
55. $10\frac{1}{2}$
56. $\frac{9}{16}$
57. $\frac{9}{16}$
58. $11\frac{1}{4}$
59. $16\frac{1}{2}$
60. $8\frac{1}{3}$

Page 23 Fraction Word Problems

1. $2\frac{53}{60}$
2. $4\frac{1}{2}$
3. 96
4. 750
5. $13\frac{1}{3}$
6. $1\frac{5}{6}$

Page 24 Changing Fractions to Decimals

1. 0.8
2. $0.\overline{6}$
3. 0.5
4. $0.\overline{55}$
5. 0.1
6. 0.625
7. $0.8\overline{3}$
8. $0.1\overline{6}$
9. 0.6
10. 0.7
11. $0.\overline{36}$
12. $0.\overline{11}$
13. $0.\overline{77}$
14. 0.9
15. 0.25
16. 0.375
17. 0.1875
18. 0.75
19. $0.\overline{8}$
20. $0.41\overline{6}$

Page 25 Changing Mixed Numbers to Decimals

1. $5.\overline{6}$
2. $8.\overline{45}$
3. 15.6
4. $13.\overline{6}$
5. $30.\overline{3}$
6. 3.5
7. 1.875
8. 4.09
9. 6.8
10. 13.5
11. 12.8
12. 11.625
13. 7.25
14. $12.\overline{3}$
15. 1.625
16. 2.75
17. 10.1
18. 20.4
19. 4.9
20. $5.\overline{36}$

Page 29 Changing Percents to Fractions

1. $\frac{1}{2}$	5. $\frac{13}{25}$	9. $\frac{9}{50}$	13. $\frac{4}{25}$	17. $\frac{99}{100}$
2. $\frac{13}{100}$	6. $\frac{63}{100}$	10. $\frac{3}{100}$	14. $\frac{1}{100}$	18. $\frac{3}{10}$
3. $\frac{11}{50}$	7. $\frac{3}{4}$	11. $\frac{1}{4}$	15. $\frac{79}{100}$	19. $\frac{21}{50}$
4. $\frac{19}{20}$	8. $\frac{91}{100}$	12. $\frac{1}{20}$	16. $\frac{2}{5}$	20. $\frac{21}{25}$

Page 29 Changing Fractions to Percents

1. 20%	4. 37.5%	7. 10%	10. 75%	13. 6.25%	16. 35%
2. 62.5%	5. 18.75%	8. 80%	11. 12.5%	14. 25%	17. 40%
3. 43.75%	6. 19%	9. 93.75%	12. 31.25%	15. 4%	18. 64%

Page 30 Changing Percents to Mixed Numbers

1. $1\frac{1}{2}$	5. $2\frac{13}{25}$	9. $1\frac{2}{25}$	13. $5\frac{4}{25}$	17. $1\frac{99}{100}$
2. $1\frac{13}{100}$	6. $1\frac{63}{100}$	10. $4\frac{53}{100}$	14. $1\frac{61}{100}$	18. 3
3. $2\frac{11}{50}$	7. $2\frac{3}{4}$	11. $2\frac{1}{20}$	15. $1\frac{79}{100}$	19. $1\frac{1}{4}$
4. $3\frac{19}{20}$	8. $2\frac{91}{100}$	12. $4\frac{1}{20}$	16. $3\frac{2}{5}$	20. $3\frac{21}{25}$

Page 30 Changing Mixed Numbers to Percents

1. 550%	4. 325%	7. 130%	10. 252%	13. 118.75%	16. 480%
2. 875%	5. 487.5%	8. 620%	11. 112.5%	14. 106.25%	17. 340%
3. 100%	6. 300%	9. 400%	12. 200%	15. 500%	18. 600%

Page 31 Changing to Percent Word Problems

1. 75%	4. 80%	7. 48%	10. 92%	13. 87.5%	16. 95%
2. 20%	5. 25%	8. 75%	11. 40%	14. 52%	17. 68%
3. 30%	6. 16%	9. 72%	12. 85%	15. 82.4%	18. 15%

Page 32 Finding the Percent of the Total

1. 34	3. 459	5. 475	7. 71.76	9. \$520, 000
2. 9	4. 2, 070	6. 24	8. \$580.45	10. 465

Chapter 2 Exponents and Roots

Page 37 Understanding Exponents

1. 7^4
2. 10^2
3. 12^3
4. 4^4
5. 9^3
6. 25^2
7. -512
8. 144
9. 20
10. 625

Page 38 Multiplication with Exponents

1. $15,625$
2. $1,679,616$
3. $4,096$
4. $282,475,249$
5. $60,466,176$
6. 256
7. 400
8. 1
9. 729
10. $1,024$
11. 81
12. $16a^4$
13. $6,561$
14. $65,\ 536$
15. $1,296$
16. 625
17. 576
18. $729a^{15}$
19. $16,384$
20. $36b^{10}$
21. $15,625$
22. $59,049$
23. $9a^2$
24. $6,561$
25. $65,536$
26. $16b^{12}$
27. $3,125a^{10}$
28. $64a^6$
29. $6,561$
30. $1,000,000,000$
31. 225
32. $117,649$

Page 39 Division with Exponents

1. $\frac{5}{x^4}$
2. $\frac{1}{4}$
3. $\frac{4}{9}$
4. $\frac{6}{a^2}$
5. 27
6. $\frac{1}{25a^2}$
7. 3
8. $\frac{343}{512}$
9. $\frac{1}{36a^2}$
10. x^2
11. $3y^2$
12. $27a^2$
13. $\frac{1}{32x^{10}}$
14. $\frac{2}{x^2}$
15. $\frac{1}{a^6}$
16. $\frac{1}{64}$
17. $\frac{1}{4}$
18. 9
19. $\frac{1}{1024y^5}$
20. $\frac{4}{y^5}$

Page 40 Square Root

1. 7
2. 9
3. 5
4. 4
5. 11
6. 25
7. 10
8. 17
9. 14
10. 6
11. 2
12. 30
13. 8
14. 3
15. 12

Page 40 Simplifying Square Roots

1. $7\sqrt{2}$
2. $10\sqrt{6}$
3. $5\sqrt{2}$
4. $3\sqrt{3}$
5. $2\sqrt{2}$
6. $3\sqrt{7}$
7. $4\sqrt{3}$
8. $5\sqrt{3}$
9. $3\sqrt{6}$
10. $2\sqrt{10}$
11. $6\sqrt{2}$
12. $4\sqrt{5}$
13. $3\sqrt{10}$
14. $5\sqrt{7}$
15. $3\sqrt{2}$
16. $2\sqrt{5}$

Chapter 3 Introduction to Algebra

Page 46 Substituting Numbers for Variables

1. 10
2. 11
3. 3
4. 16
5. 50
6. 10
7. 21
8. 7
9. 41
10. 7
11. 63
12. 14
13. 26
14. −40
15. 2
16. 2
17. 18
18. −80
19. −15
20. 40
21. −3
22. 34
23. −25
24. 111

Page 48 Understanding Algebra Word Problems

1. C
2. D
3. A
4. B
5. D
6. C
7. E
8. B
9. A
10. B
11. E
12. C
13. $x - 3$
14. $\frac{y}{10}$
15. $t + 5$
16. $n - 14$
17. $5k$
18. $z + 12$
19. $2b$
20. $x + 1$
21. $\frac{t}{4}$
22. $\frac{y}{2}$
23. $2b$
24. $3y$
25. $n + 4$
26. $t - 6$
27. $\frac{18}{x}$
28. $10 - n$
29. $3 + p$
30. $4m$
31. $y - 20$
32. $5x$

Page 49 Setting Up Algebra Word Problems

1. $3n = 2,700$
2. $5y = 15$
3. $4(x - 2) = 20$
4. $\frac{t}{5} = 45$
5. $p - 54 = 320$
6. $\frac{1}{2}x + \$50 = \$262$
7. $\frac{100}{5} = n$
8. $50 - y = 82$
9. $\$200 + x = \$500$
10. $\frac{1}{2}h + 17 = 35$
11. $\$2,300 = 2x$
12. $\frac{w}{4} = 32$
13. $6 - d = 12$
14. $4(y + 10) = 48$
15. $x - 5 = 42$
16. $\frac{36}{b} = 12$

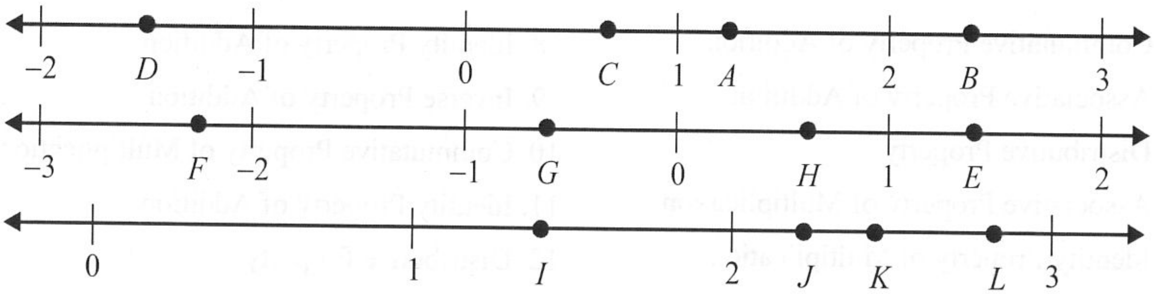
Page 50 Changing Algebra Word Problems to Algebraic Equations

1. $f + f - 14 + f + 6 = 91$
2. $r = 0.05 \times \$11 \times 40 \times w$
3. $p = \$2,530 - (0.40 \times \$2,530)$
4. $f = 0.75x + (0.06 \times 0.75x)$
5. $p = \$600 - \$100 - 8w$
6. $y = (6 \times \$3.50) + t$
7. $m = x(\$40.50 - \$34.50)$

Page 51 Substituting Numbers in Formulas

1. 132 in^3
2. 56, 520 in^3
3. 56 board ft
4. 24
5. 25.12 cm
6. 306 in^2
7. 904.32 cm^3
8. 25.12 cm^2
9. 20°C
10. 267.95 cm^3
11. 340.17 cm^2

Page 59 Recognizing Improper Fractions, Decimals, and Square Root Values on a Number Line

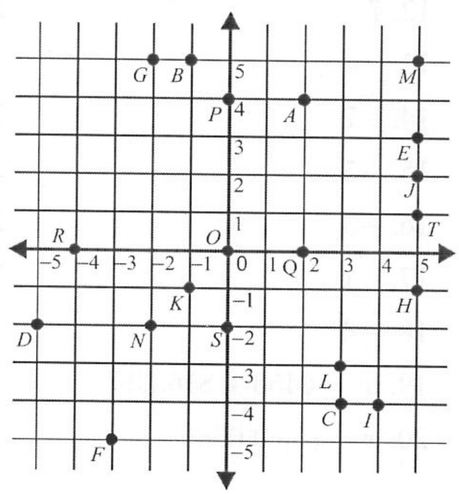


4. G 7. B 10. I 13. S 16. M 19. J

5. H 8. A 11. E 14. K 17. P 20. R

6. F 9. C 12. D 15. N 18. L 21. Q

Page 60 Cartesian Coordinates



Page 61 Identifying Ordered Pairs

1. $(-6, 2)$, II
2. $(1, 2)$, I
3. $(-2, 6)$, II
4. $(-3, -2)$, III
5. $(-3, 1)$, II
6. $(2, -2)$, IV
7. $(4, -4)$, IV
8. $(3, 1)$, I
9. $(2, 6)$, I
10. $(-2, 3)$, II
11. $(-1, -7)$, III
12. $(6, -6)$, IV
13. $(5, -3)$, IV
14. $(-4, -5)$, III
15. $(4, 5)$, I
16. $(-5, 4)$, II
17. $(-5, -3)$, III
18. $(-6, -1)$, III

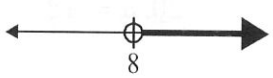
Page 67 Multiplying and Dividing with Negative Numbers

1. $z = -3$
2. $y = -100$
3. $k = -9$
4. $x = -6$
5. $t = -28$
6. $r = 20$
7. $x = 8$
8. $x = -18$
9. $w = -55$
10. $y = -7$
11. $x = 36$
12. $t = -7$
13. $x = 2$
14. $m = -36$
15. $c = 36$
16. $d = -56$
17. $y = 36$
18. $w = 4$
19. $v = -3$
20. $z = -4$
21. $x = \frac{3}{4}$
22. $y = -\frac{7}{12}$
23. $a = -44$
24. $b = -\frac{1}{3}$
25. $a = -\frac{36}{13}$
26. $b = 28$
27. $x = \frac{1}{4}$
28. $y = 54$
29. $x = 23$
30. $x = -1$
31. $y = \frac{1}{9}$
32. $d = -50$
33. $z = 26$
34. $c = -9$
35. $d = -\frac{3}{2}$
36. $d = \frac{3}{2}$
37. $w = -\frac{3}{8}$
38. $p = -7$
39. $a = 2$
40. $p = -30$

Page 67 Variables with a Coefficient of Negative One

1. $w = -14$
2. $a = -20$
3. $x = 15$
4. $x = 25$
5. $y = 16$
6. $t = -62$
7. $p = 34$
8. $m = -81$
9. $w = -17$
10. $v = 9$
11. $k = -13$
12. $q = -7$

Page 68 Graphing Inequalities

1. 

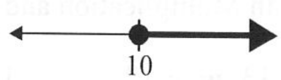
2. 

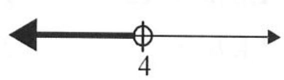
3. 

4. 

5. 

6. 

7. 

8. 

9. 

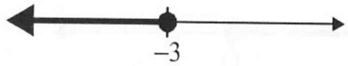
10. 

11. $x \geq 0$
12. $x < -4$ or $x \geq 10$
13. $2 \leq x \leq 4$
14. $x < 8$
15. $-10 < x < -4$
16. $x \leq -1$ or $x \geq 3$
17. $x \leq -5$
18. $x > 6$

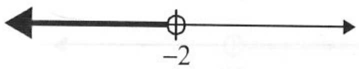
Chapter 5 Review

Page 71

1. $y = -5$
2. $x = 20$
3. $d = 25$
4. $a = -48$
5. $t = -2$
6. $b = -\frac{6}{7}$
7. $c = 30$
8. $z = -4$
9. $d = -\frac{4}{13}$
10. $x = -28$
11. $k = 3$
12. $y = 14$
13. $h = -11$
14. $p = \frac{1}{7}$
15. $b = 44$
16. $p = 38$
17. $x = 7$
18. $m = 10$
19. $k = -52$
20. $a = \frac{7}{18}$

21. 

22. 

23. 

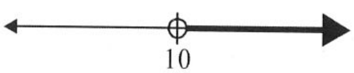
24. 

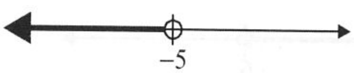
25. $x \geq 3$

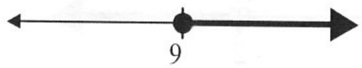
26. $5 \leq x < 9$

27. $x < -2$ or $x \geq 0$

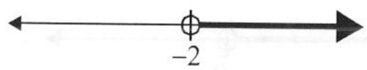
28. $x > 10$

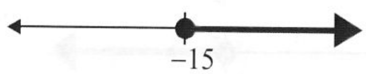
29. 

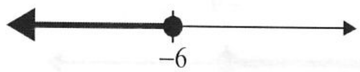
30. 

31. 

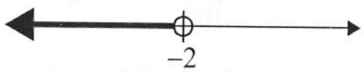
32. 

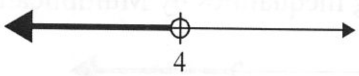
33. 

34. 

35. 

36. 

37. 

38. 

Chapter 6 Solving Multi-Step Equations and Inequalities

Page 73 Two-Step Algebra Problems

1. $x = -5$
2. $y = 7$
3. $t = 7$
4. $p = -3$
5. $m = 9$
6. $x = 9$
7. $x = -8$
8. $d = 6$
9. $h = 7$
10. $b = -3$
11. $g = -7$
12. $k = -6$
13. $r = -11$
14. $y = 8$
15. $f = 3$
16. $t = 3$
17. $y = 7$
18. $p = 4$
19. $h = 4$
20. $w = 5$

Page 73 Two-Step Algebra Problems with Fractions

1. $y = 9$
2. $a = 14$
3. $w = 45$
4. $x = 36$
5. $b = -36$
6. $z = -40$
7. $x = 20$
8. $c = -40$
9. $x = 44$
10. $m = -12$
11. $p = -21$
12. $t = -48$
13. $v = 49$
14. $h = 30$
15. $k = 70$
16. $y = -20$
17. $z = -28$
18. $b = -30$

Pages 78–79 Multi-Step Algebra Problems

1. $y = -6$
2. $a = 8$
3. $x = 9$
4. $y = -3$
5. $x = 5$
6. $a = -14$
7. $b = -5$
8. $y = -2$
9. $x = 11$
10. $n = 27$
11. $x = -3$
12. $a = -2$
13. $x = -4$
14. $x = 3$
15. $a = -8$
16. $x = 19$
17. $b = 4$
18. $x = -1$
19. $x = 3$
20. $c = 1$
21. $a = -7$
22. $x = -1$
23. $y = -2$
24. $y = 2$
25. $a = -2$
26. $m = -4$
27. $b = 12$
28. $b = 12$
29. $x = -3$
30. $x = -7$
31. $x = -2$
32. $x = 5$
33. $x = 1$
34. $c = -3$
35. $y = -9$
36. $x = 8$

Page 81 Multi-Step Inequalities

1. $x \geq 1$
2. $x \leq -5$
3. $b > 21$
4. $y > -12$
5. $a < -11$
6. $a > 0$
7. $x \leq 1$
8. $x \leq 7$
9. $x < -48$
10. $x \geq -9$
11. $b < -13$
12. $x \geq -6$
13. $x \leq -\frac{7}{4}$
14. $y > 6$
15. $y \geq 3$
16. $c \geq -\frac{1}{2}$
17. $x < -14$
18. $y \leq 16$
19. $x < -\frac{1}{3}$
20. $y \geq 24$
21. $c < -\frac{9}{4}$
22. $a < 2$
23. $b \leq -3$
24. $x < -2$

Page 82 Solving Equations and Inequalities with Absolute Values

1. $y = \{-4, 4\}$
2. $-3 < x < 3$
3. $k = \{-2, 2\}$
4. $-6 < n < 6$
5. $z = \{-3, 3\}$
6. $-2 < m < 2$
7. $x < -5, x > 5$
8. $g = \{-2, 2\}$
9. $x = \{-4, 4\}$
10. $-4 < w < 4$
11. $-2 < r < 2$
12. $t = \{-17, 17\}$
13. $-6 < x < 6$
14. $-4 \leq c \leq 4$
15. $k < -2, k > 2$
16. $p = \{-4, 4\}$
17. $b < -3, b > 3$
18. $q = \{-4, 4\}$
19. $y < -\frac{1}{2}, y > \frac{1}{2}$
20. $s = \{-4, 4\}$
21. $e \leq -10, e \geq 10$

Page 84 More Solving Equations and Inequalities with Absolute Values

1. $x = \{7, -11\}$
2. $b < -\frac{1}{2}, b > 4$
3. $-3 < e < 2\frac{1}{2}$
4. $f < -4\frac{1}{2}, f > 8$
5. $b = \left\{-1, 3\frac{8}{9}\right\}$
6. $-1\frac{1}{7} < b < 7$
7. $w < -13\frac{1}{7}, w > 12\frac{4}{7}$
8. $d = \{-10, 18\}$
9. $x < -3\frac{1}{4}, x > 9$
10. $x > -2\frac{1}{10}, x < -4$
11. $a = \left\{-8, 1\frac{1}{2}\right\}$
12. $-3\frac{3}{4} < k < 19\frac{3}{4}$
13. $d = \left\{-4, 2\frac{1}{2}\right\}$
14. $v < 11, v > -19$
15. $p = \{-2, 1\}$
16. $-4\frac{1}{3} < v < -3$
17. $m = \left\{-3\frac{2}{5}, -5\right\}$
18. $e < -5\frac{1}{2}, e > \frac{1}{3}$
19. $-13 < j < 9$
20. $m = \left\{-\frac{4}{5}, -1\frac{1}{15}\right\}$
21. $j < -42, j > -8$
22. $i = \left\{-3, -8\frac{2}{3}\right\}$
23. $r < -3, r > 9\frac{1}{2}$
24. $s = \left\{-12\frac{1}{3}, 4\right\}$
25. $t < -16, t > 10$
26. $-3\frac{7}{9} < q < 6$
27. $v < \frac{1}{2}, v > 4$
28. $i = \left\{-2\frac{7}{8}, 7\right\}$
29. $-\frac{1}{3} < p < 5$
30. $-3 < f < 13$

Page 90 Solving Proportions

1. 15
2. 15
3. 9
4. 21
5. 30
6. 9
7. 18
8. 4
9. 30
10. 3
11. 12
12. 8
13. 3
14. 1
15. 49
16. 4
17. 6
18. 2

Page 91 Ratio and Proportion Word Problems

1. 7 hr
2. 15 ft
3. 320
4. 5
5. 500 sq ft
6. 250 min
7. 20
8. $4.20
9. 1,500

Page 94 Direct and Indirect Variation

1. 10
2. 8
3. 21
4. 12
5. 18
6. 3
7. 9
8. 18
9. 10
10. 4
11. 20 min
12. 3 movies
13. $6.95
14. 26.4 mph
15. 7.5 min
16. 63 min

Page 95 Maps and Scale Drawings

1. 1 in
2. 22.5 km
3. 300 km
4. 7 in
5. 6.5 cm
6. 15 ft

Chapter 7 Review
Page 96

1. 16
2. 4
3. 2
4. 18
5. $\frac{9}{20}$
6. 162
7. $\frac{4}{47}$
8. 7.5
9. 375 km
10. 9 yards
11. 376 widgets
12. 6 hours
13. 60 miles/hour
14. 340 feet/hour
15. 80 songs/month
16. 110 miles

Page 101 Finding the Greatest Common Factor of Polynomials

1. $6x^2(x^2+3)$
2. $7y(2y^2+1)$
3. $4b^3(b^2+3)$
4. $5(2a^3+1)$
5. $2y^2(y+4)$
6. $6x^2(x^2-2)$
7. $6y(3y-2)$
8. $5a^2(3a-5)$
9. $4x^2(x+4)$
10. $3b^2(2+7b^3)$
11. $9m^3(3+2m)$
12. $25x^3(4x-1)$
13. $4b^3(b-3)$
14. $6c(3c+4)$
15. $10y^3(2+3y^2)$
16. $8x^2(2-3x^3)$
17. $5a^2(3a^2-5)$
18. $8b^3(3+2b^3)$
19. $9y^2(4y^2+1)$
20. $7x(6x^2+7)$

Page 102 Finding the Greatest Common Factor of Polynomials

1. $5a(a^2+3a+4)$
2. $6y^2(3y^2+y+4)$
3. $x^2(12x^3+21x+1)$
4. $3b^2(2b^2+b+5)$
5. $7c(2c^2+4c+1)$
6. $5b(3b^3-b+4)$
7. $t(t^2+3t-5)$
8. $4a(2a^2-a+3)$
9. $2b^2(8b^3-6b^2-5)$
10. $4x(5x^3+4x^2-6x+7)$
11. $10b^3(4b^4+3b^2-5)$
12. $5y^2(4y^2-3y+6)$
13. $2m^2(2m^3+4m^2+6m+3)$
14. $4x^2(4x^3+5x^2-3x+6)$
15. $3y^2(6y^2+7y-3)$
16. $3n(n^4+3n^2+4n+5)$
17. $2d(2d^5-4d+1)$
18. $2(5w^2+2w+1)$
19. $3t(2t^2-t+3)$
20. $5p^2(5p^3-2p-1)$
21. $9x(2x^3+x-4)$
22. $6b(b^3-2b-1)$
23. $y(y^2+3y-9)$
24. $2x^2(5x^3-x^2+2)$

Page 102 Finding the Greatest Common Factor of Polynomials

1. $3a^2b^2(1-2ab^2+3b)$
2. $6x^3y^3(2x+3y-4)$
3. $5x^2y(4-5xy^2)$
4. $4xy(3x-5xy+4y)$
5. $4a^2b(2a+3+5b^2)$
6. $6c(6c^3+7c^2+4c-3)$
7. $14m^2n^2(mn^2-2m+3n)$
8. $4xy^2(4x^3-6x^2+3x-2)$
9. $8c^2d^2(4cd^2-7d+8c^2)$
10. $3a^2b^2(7a^2b+9b+5a)$
11. $2wt(2w^2t+3w-4t)$
12. $pq(5q^2-2pq-9p^2)$
13. $7xt^2(7x^2t+1-2t)$
14. $3d^3(3cd-d-2c^2)$
15. $2ab(6ab^2-7+5b)$
16. $5x(5x^3+2-4x)$
17. $bx(x^2-bx+b^2)$
18. $2ka(2k^2a+11+8ka)$

Page 107 Factoring Trinomials

1. $(x+1)(x-2)$
2. $(y-2)(y+3)$
3. $(w+4)(w-1)$
4. $(t+2)(t+3)$
5. $(x+4)(x-2)$
6. $(k-3)(k-1)$
7. $(t-2)(t+5)$
8. $(x+1)(x-4)$
9. $(y-3)(y-2)$
10. $(y+5)(y-4)$
11. $(a+2)(a-3)$
12. $(b+1)(b-5)$
13. $(c+2)(c-7)$
14. $(c-4)(c+3)$
15. $(d+3)(d-2)$
16. $(x-7)(x+4)$
17. $(y+6)(y-3)$
18. $(a-4)(a-5)$
19. $(b+3)(b-5)$
20. $(c-1)(c+8)$
21. $(t-5)(t-6)$
22. $(w+9)(w+4)$
23. $(m-8)(m+6)$
24. $(y+7)(y+7)$
25. $(x+2)(x+5)$
26. $(a-6)(a-1)$
27. $(d-9)(d+3)$

Page 108 More Factoring Trinomials

1. $2(x+1)(x+2)$
2. $3(y-2)(y-1)$
3. $2(a+3)(a-2)$
4. $4(b+2)(b+5)$
5. $3(y-3)(y+1)$
6. $10(x-4)(x+5)$
7. $5(c+2)(c-4)$
8. $6(d-1)(d+6)$
9. $4(x+5)(x-3)$
10. $6(a-4)(a+1)$
11. $5(b+3)(b+5)$
12. $3(c-4)(c+2)$
13. $2(x-7)(x-2)$
14. $4(y-4)(y-1)$
15. $7(a+2)(a-3)$
16. $6(b-5)(b+2)$
17. $11(d+4)(d+2)$
18. $3(x-5)(x-3)$

Page 108 More Factoring Trinomials

1. $x^2(x-4)(x+3)$
2. $3c(c+2)(c-4)$
3. $5b(b+4)(b-2)$
4. $3y^2(y+1)(y-3)$
5. $2x^3(x+5)(x-1)$
6. $6d(d+2)(d+2)$
7. $2y(y-4)(y-4)$
8. $6b^2(b-5)(b+2)$
9. $a(a-4)(a+1)$
10. $4x^2(x-2)(x+3)$
11. $y^3(y+6)(y-7)$
12. $b^2(b+8)(b+3)$
13. $4c(c+3)(c-4)$
14. $11a^2(a+2)(a+1)$
15. $2x^3(x+8)(x-7)$
16. $10d(d+2)(d-9)$
17. $4y^4(y-2)(y+3)$
18. $2a(a-2)(a-5)$
19. $6b^3(b-1)(b-3)$
20. $x^4(x+1)(x+1)$
21. $5d^2(d-2)(d-5)$
22. $a(a+9)(a-6)$
23. $3y(y-7)(y-7)$
24. $8x(x+1)(x+2)$

Page 114 Solving the Difference of Two Squares

1. $\{-\frac{4}{5}, \frac{4}{5}\}$
2. $\{-6, 6\}$
3. $\{-\frac{8}{3}, \frac{8}{3}\}$
4. $\{-\frac{7}{10}, \frac{7}{10}\}$
5. $\{-\frac{9}{2}, \frac{9}{2}\}$
6. $\{-5, 5\}$
7. $\{-\frac{1}{3}, \frac{1}{3}\}$
8. $\{-\frac{3}{4}, \frac{3}{4}\}$
9. $\{-\frac{1}{6}, \frac{1}{6}\}$
10. $\{-\frac{5}{6}, \frac{5}{6}\}$
11. $\{-4, 4\}$
12. $\{-\frac{3}{8}, \frac{3}{8}\}$
13. $\{-\frac{2}{9}, \frac{2}{9}\}$
14. $\{-\frac{5}{8}, \frac{5}{8}\}$
15. $\{-\frac{7}{2}, \frac{7}{2}\}$
16. $\{-9, 9\}$
17. $\{-\frac{3}{7}, \frac{3}{7}\}$
18. $\{-8, 8\}$
19. $\{-\frac{2}{3}, \frac{2}{3}\}$
20. $\{-\frac{3}{2}, \frac{3}{2}\}$
21. $\{-10, 10\}$
22. $\{-\frac{9}{4}, \frac{9}{4}\}$
23. $\{-\frac{4}{9}, \frac{4}{9}\}$
24. $\{-\frac{2}{3}, \frac{2}{3}\}$

Page 115 Solving Perfect Squares

1. $\{2\}$
2. $\{-1\}$
3. $\{-11\}$
4. $\{4\}$
5. $\{1\}$
6. $\{-8\}$
7. $\{-5, -1\}$
8. $\{1, 9\}$
9. $\{0, 20\}$
10. $\{-12, -6\}$
11. $\{-0.5, 9.5\}$
12. $\{-13, -1\}$
13. $\{-9, 5\}$
14. $\{-1, 3\}$
15. $\{-15.9, -1.9\}$
16. $\{-3, 15\}$
17. $\{1, 23\}$
18. $\{-10.5, 5.5\}$

Page 116 Completing the Square

1. $\{-3, 1\}$
2. $\{1, 7\}$
3. $\{-7, 1\}$
4. $\{-2, 18\}$
5. $\{7, 7\}$
6. $\{0, 4\}$
7. $\{-9, -3\}$
8. $\{-6, 4\}$
9. $\{-17, 5\}$
10. $\{3, 5\}$
11. $\{6, 10\}$
12. $\{-4, 12\}$
13. $\{-22, -2\}$
14. $\{-5, -1\}$
15. $\{.5, 10.5\}$

Page 117 Using the Quadratic Formula

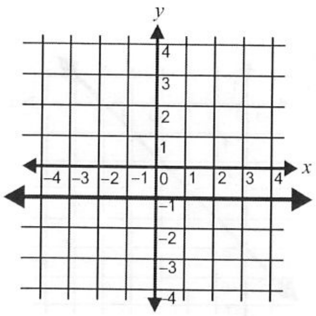
1. $\{-3, 2\}$
2. $\{-2, 4\}$
3. $\{-5, 3\}$
4. $\{1, 4\}$
5. $\{2, 7\}$
6. $\{-1, 4\}$
7. $\{-5, 4\}$
8. $\{-4, -2\}$
9. $\{3, 4\}$
10. $\{-4, 7\}$
11. $\{2, 3\}$
12. $\{-5, 2\}$
13. $\{-8, 1\}$
14. $\{-2, -1\}$
15. $\{-6, 7\}$
16. $\{-6, 1\}$
17. $\{-4, -3\}$
18. $\{-4, 3\}$
19. $\{-2, 5\}$
20. $\{-8, -2\}$
21. $\{-2, 6\}$

Chapter 9 Review

Page 118

1. $b = -\frac{5}{4}, \frac{5}{4}$
2. $b = -5, 6$
3. $x = -2, 3$
4. $x = -\frac{7}{10}, \frac{7}{10}$
5. $y = -\frac{1}{3}, 2$
6. $y = -7, 3$
7. $y = -1, 8$
8. $x = -\frac{2}{3}, \frac{1}{3}$
9. $y = -1, \frac{2}{3}$
10. $b = -4, 2$
11. $x = -5, \frac{1}{4}$
12. $x = -\frac{1}{4}, 1$
13. $y = -2, 5$
14. $x = \frac{1}{2}, \frac{2}{3}$
15. $y = -6, 3$
16. $x = -11, 1$
17. $y = 4, 10$
18. $b = -6, -3$
19. $y = -1, 13$
20. $a = -4, 12$
21. $x = -9, 7$

Page 122 Graphing Horizontal and Vertical Lines

1.


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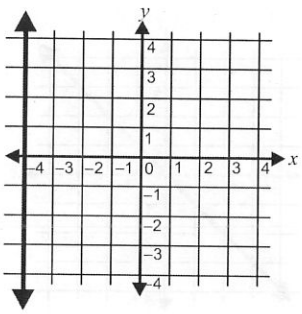

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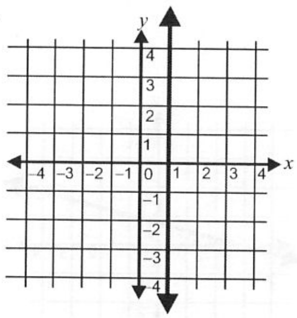

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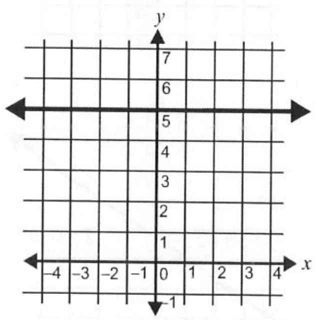

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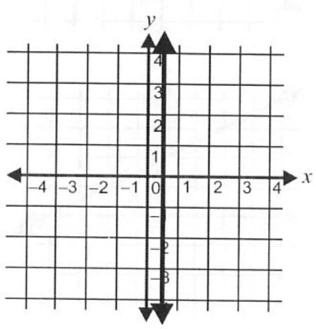

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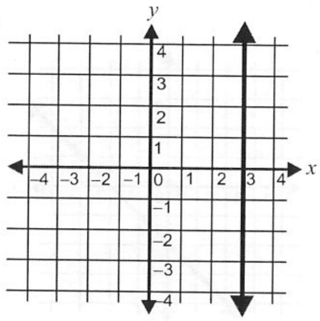

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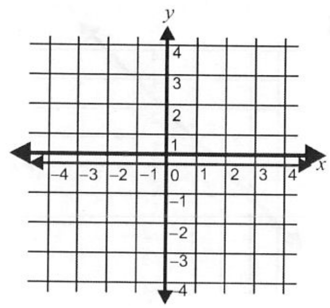

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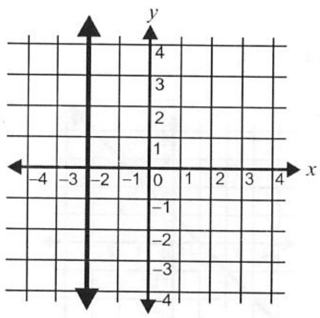

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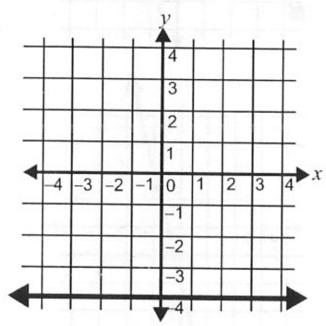

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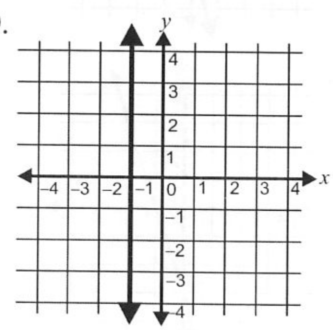

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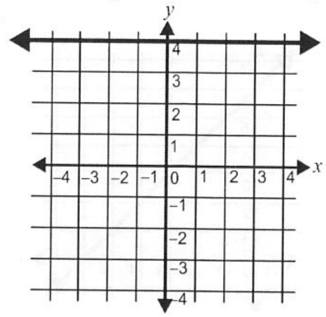

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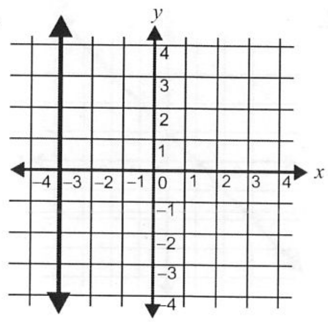

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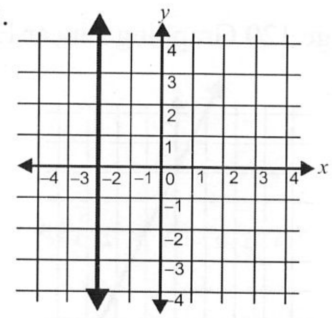

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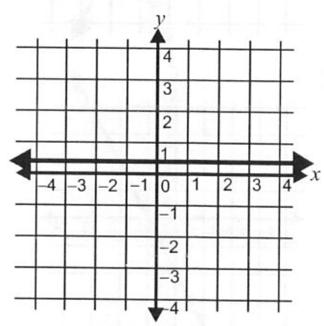

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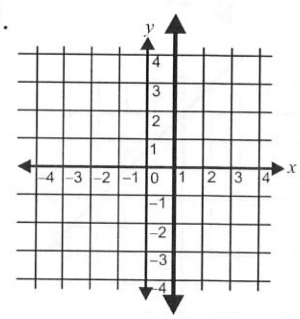
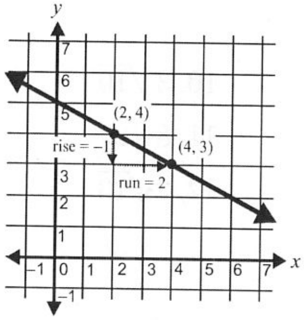
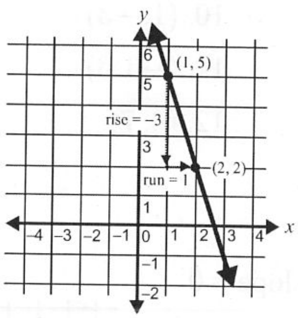


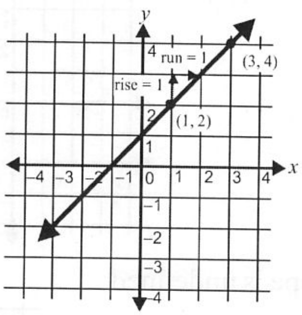
7. slope $= -\frac{1}{2}$



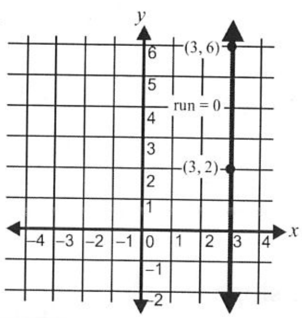
8. slope $= -3$



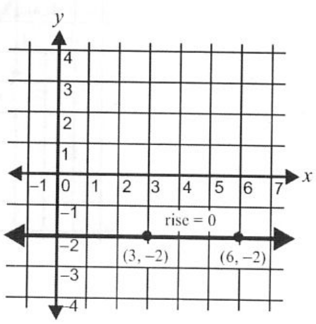
9. slope $= 1$



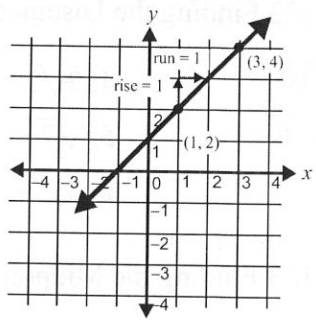
10. slope is undefined



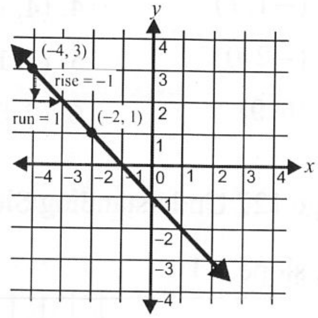
11. slope $= 0$



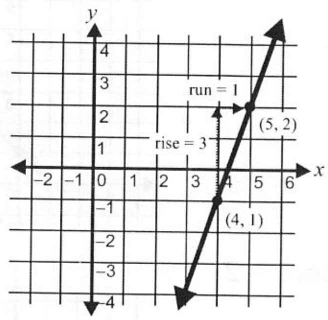
12. slope $= 1$



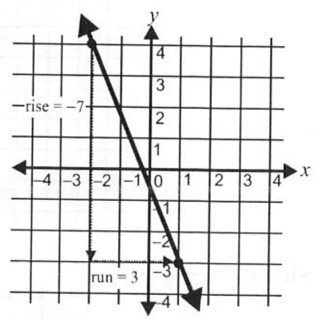
13. slope $= -1$



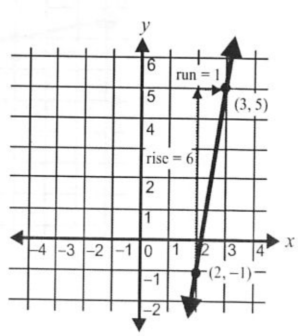
14. slope $= 3$



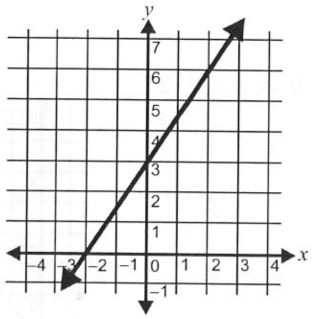
15. slope $= -\frac{7}{3}$



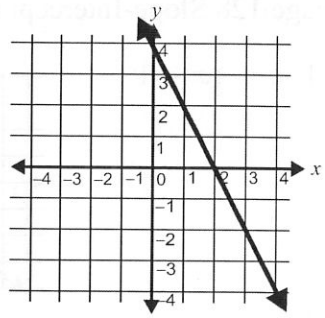
16. slope $= 6$



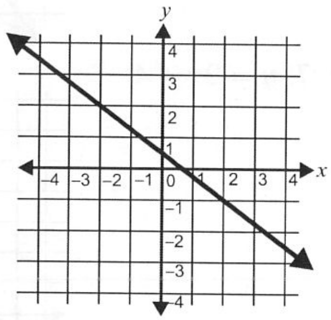
11. $y = \frac{3}{2}x + 3$



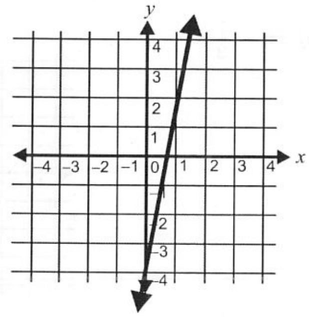
16. $y = -2x + 4$



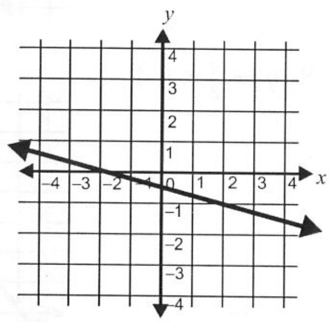
12. $y = -\frac{3}{4}x + \frac{1}{2}$



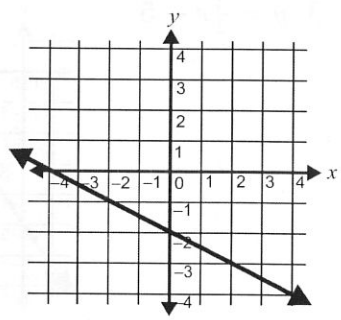
17. $y = 6x - 4$



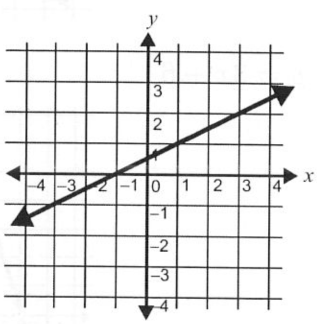
13. $y = -\frac{1}{4}x - \frac{1}{2}$



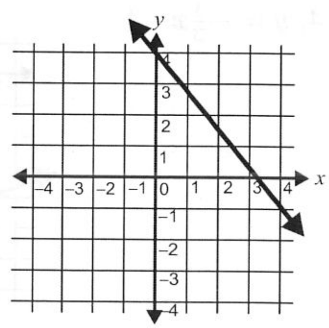
18. $y = -\frac{1}{2}x - 2$



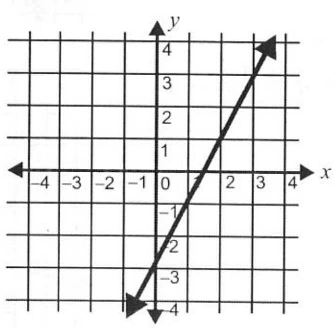
14. $y = \frac{1}{2}x + \frac{1}{2}$



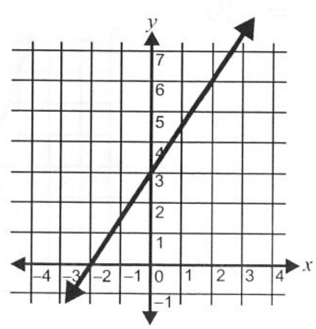
19. $y = -\frac{5}{4}x + 4$



15. $y = 2x - 3$



20. $y = \frac{3}{2}x + 3$



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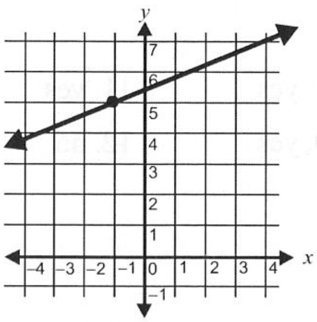

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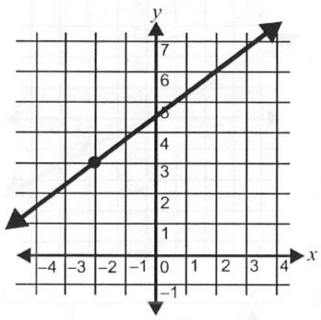

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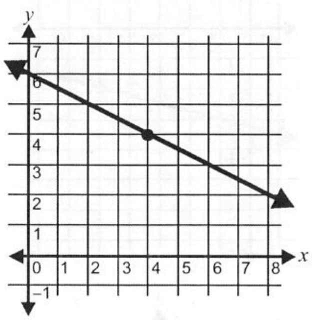

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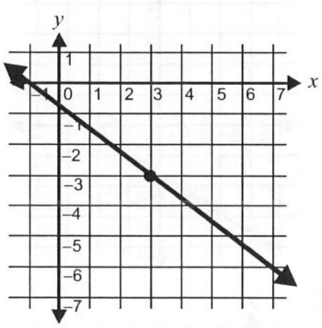

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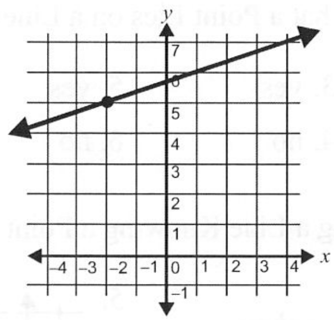

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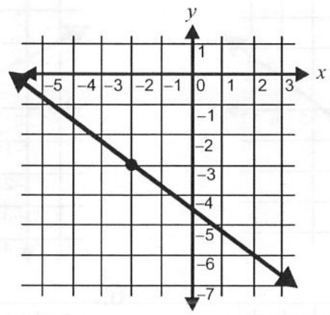

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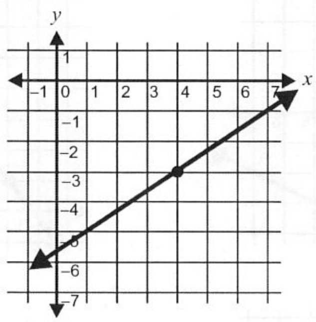

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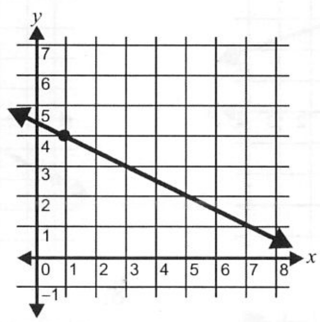
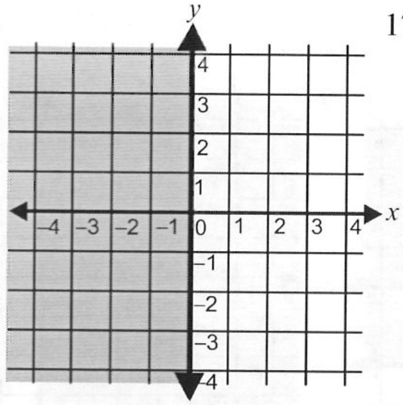


Page 130 Finding the Equation of a Line Using Two Points or a Point and Slope

1. $y = 2x - 4$
2. $y = \frac{1}{3}x + 4$
3. $y = \frac{1}{4}x + 1$
4. $y = x - 5$
5. $y = \frac{1}{2}x - \frac{11}{2}$
6. $y = -\frac{5}{3}x + \frac{7}{3}$
7. $y = \frac{4}{3}x - \frac{5}{3}$
8. $y = x + 7$
9. $y = -\frac{2}{3}x + \frac{1}{3}$
10. $y = 2x - 5$
11. $y = 2x + 7$
12. $y = \frac{4}{3}x - \frac{2}{3}$
13. $y = -2x - 1$
14. $y = \frac{1}{3}x + \frac{10}{3}$
15. $y = -\frac{3}{2}x - 2$

13.



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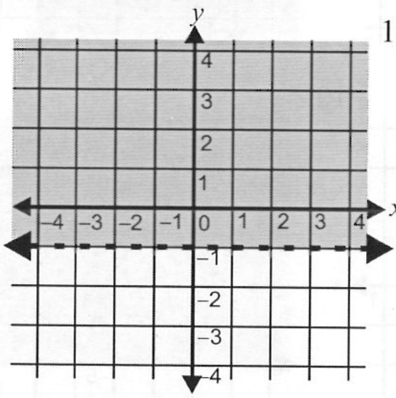

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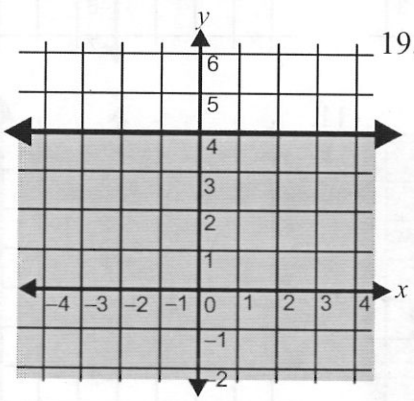

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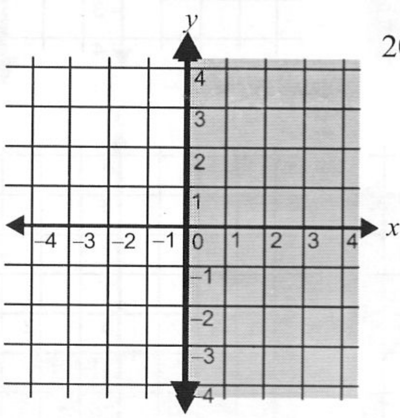

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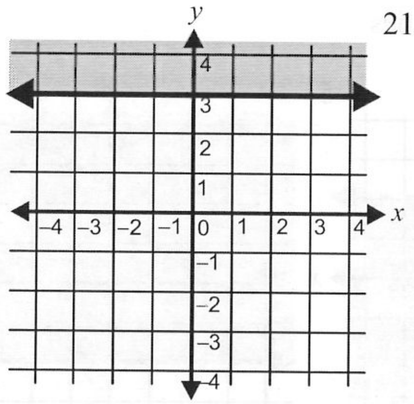

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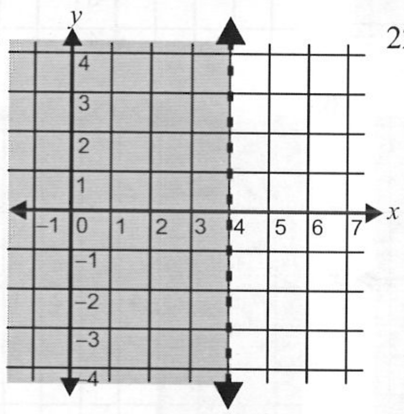

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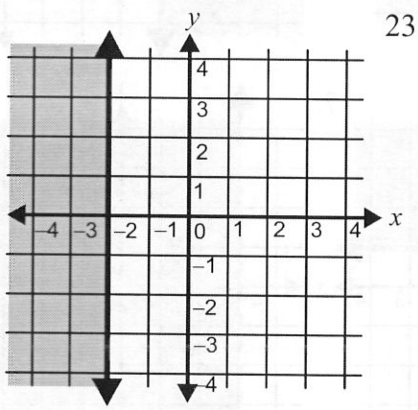

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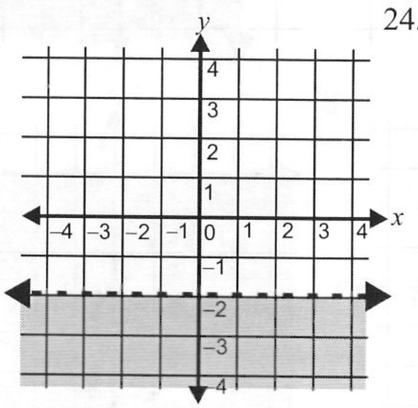

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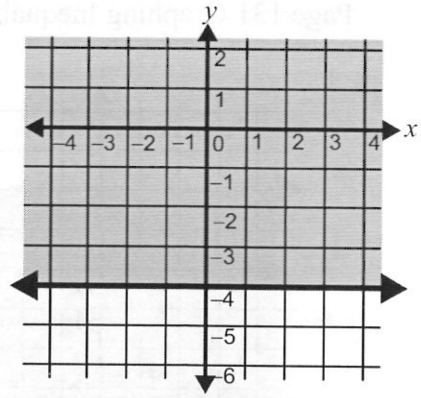

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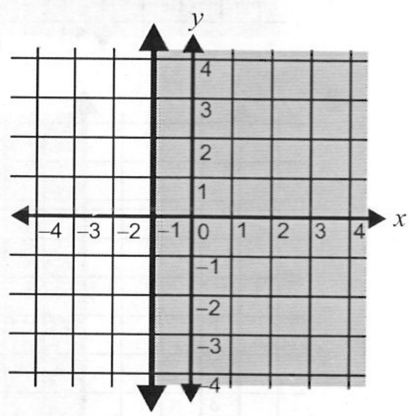

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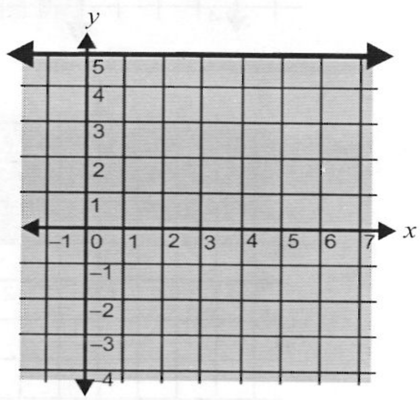

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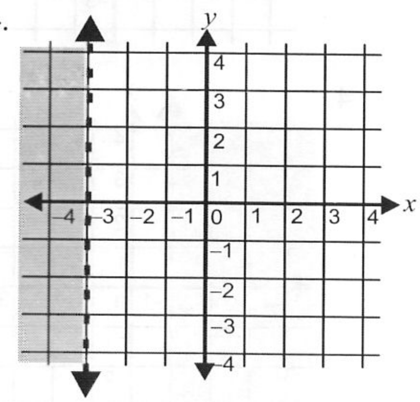
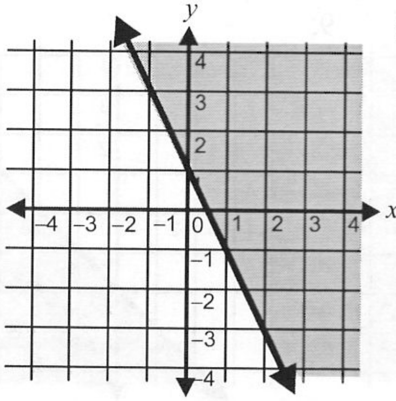


Page 133 Graphing Inequalities

1.



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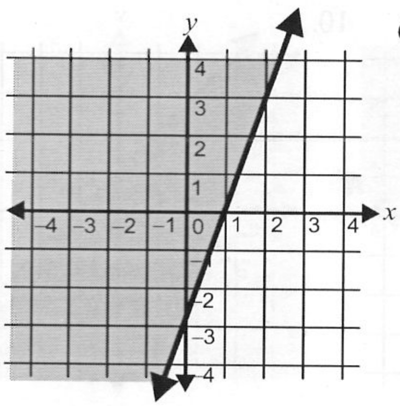

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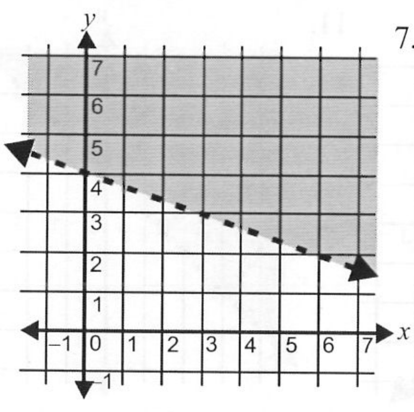

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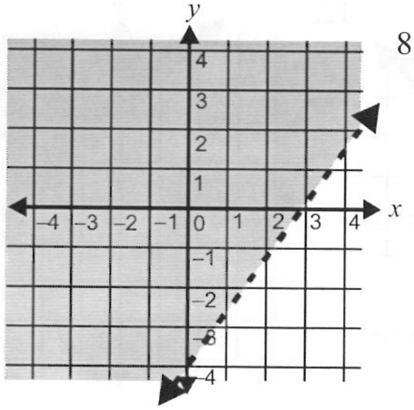

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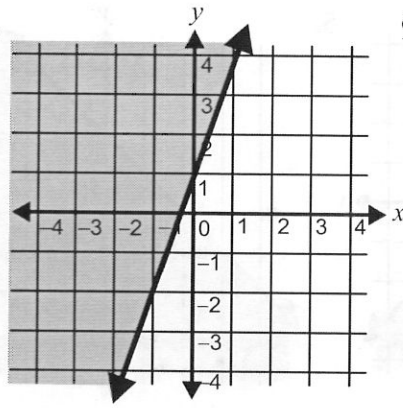

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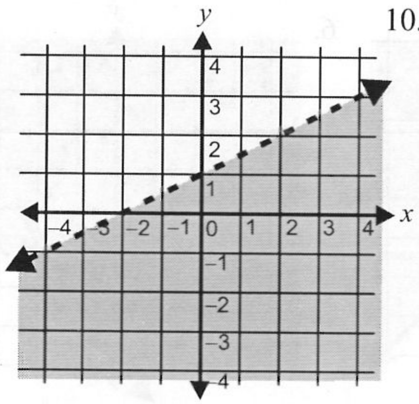

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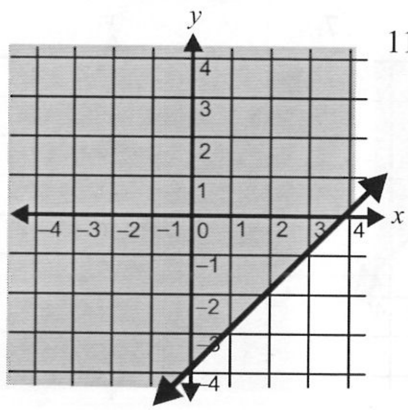

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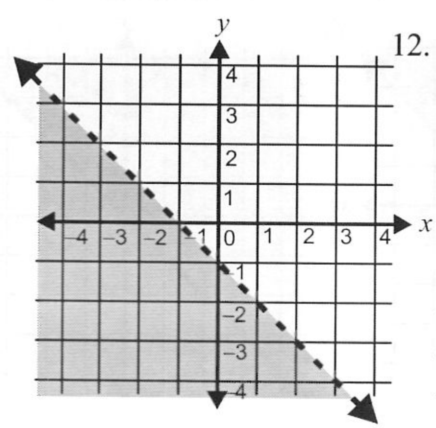

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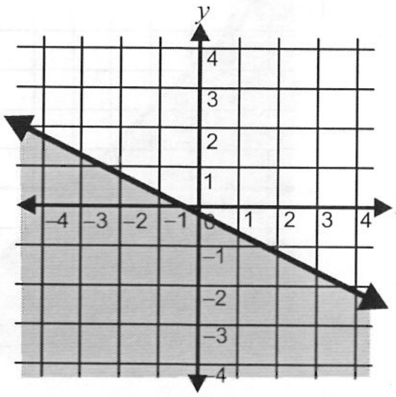

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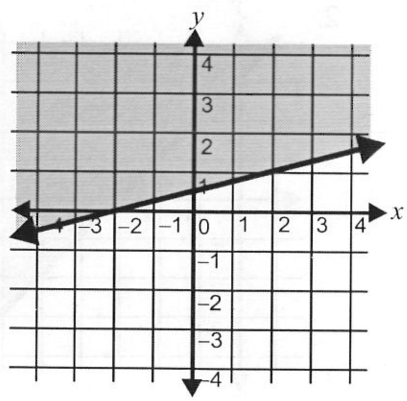

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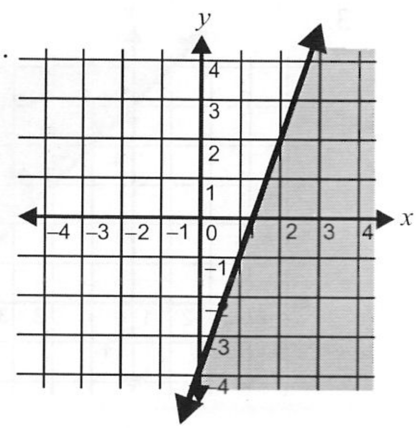

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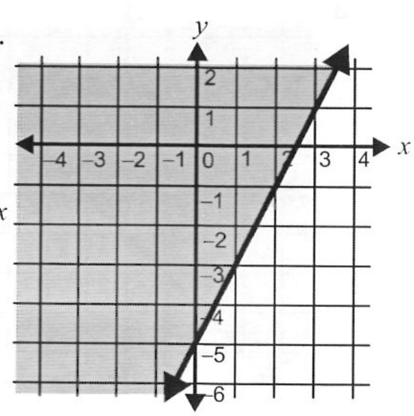
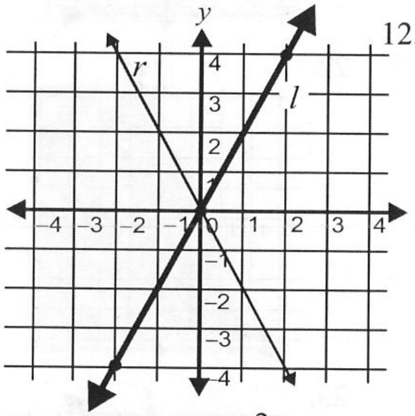


Chapter 11 Applications of Graphs

Pages 136–137 Changing the Slope of *Y*-Intercept of a Line

1. P
2. P
3. NP
4. P
5. P
6. NP
7. NP
8. NP
9. P

10.



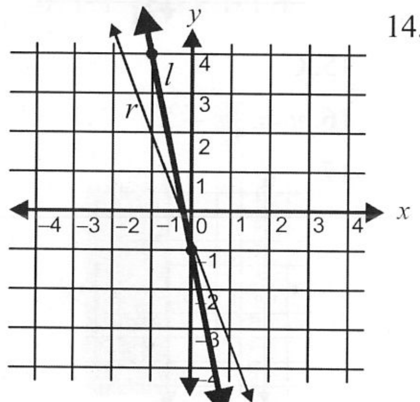
line l: $y = 2x$

line r: $y = -2x$

slopes: Same steepness, oriented in different directions

y-intercepts: (0,0) for both

12.



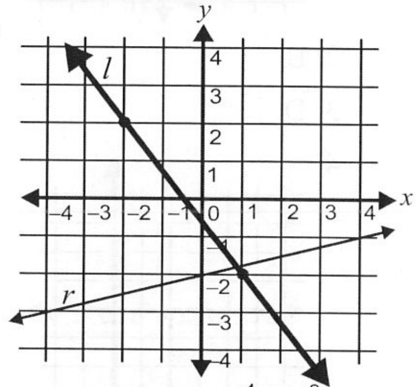
line l: $y = -4x - 1$

line r: $y = -3x - 1$

slopes: Line l is slightly steeper than line r

y-intercepts: (0, –1) for both

14.



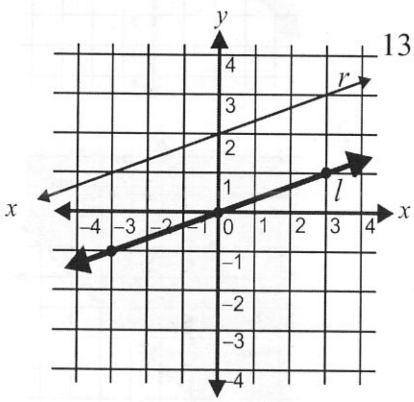
line l: $y = -\frac{4}{3}x - \frac{2}{3}$

line r: $y = \frac{1}{4}x - 2$

slopes: Line l is steeper than and oriented in the opposite direction as line r.

y-intercepts: l $(0, -\frac{3}{2})$ r $(0, -2)$

11.



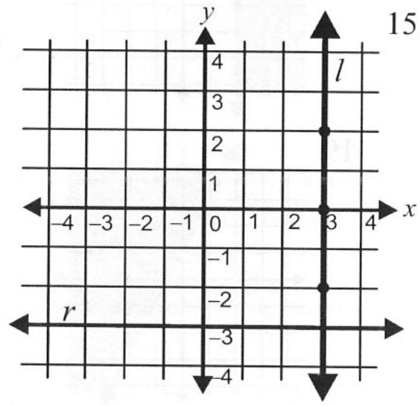
line l: $y = \frac{1}{3}x$

line r: $y = \frac{1}{3}x + 2$

slopes: Same: parallel lines

y-intercepts: l (0, 0) r (0, 2)

13.



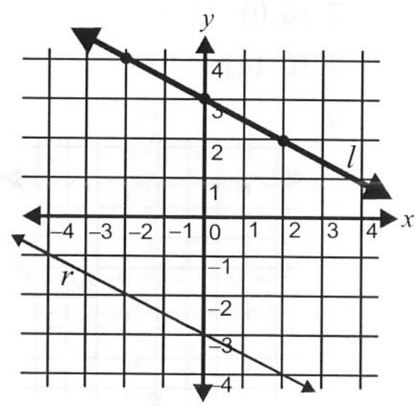
line l: $x = 3$

line r: $y = -3$

slopes: Undefined for line l, 0 for line r

y-intercepts: l: no y-intercept r: (0, –3)

15.



line l: $y = -\frac{1}{2}x + 3$

line r: $y = -\frac{1}{2}x - 3$

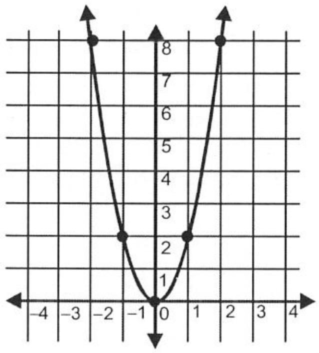
slopes: Same: parallel lines

y-intercepts: l (0, 3) r (0, –3)

Page 143 Identifying Graphs of Linear Equations

1. H 2. C 3. F 4. D 5. E 6. A 7. G 8. I 9. B

Page 144 Graphing Non-Linear Equations

1.


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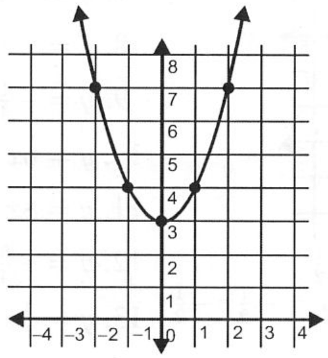

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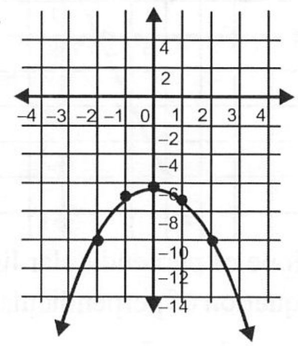

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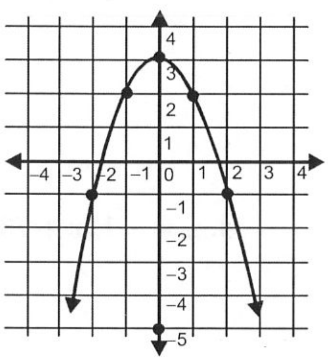

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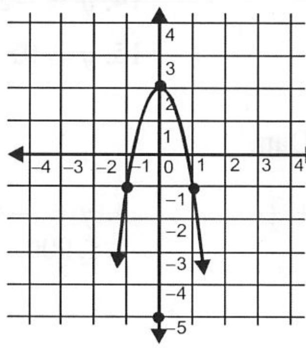

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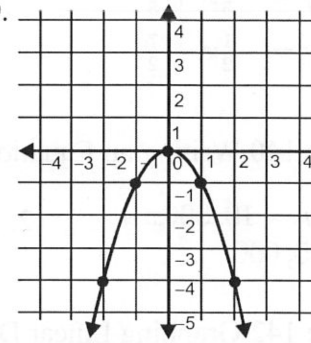

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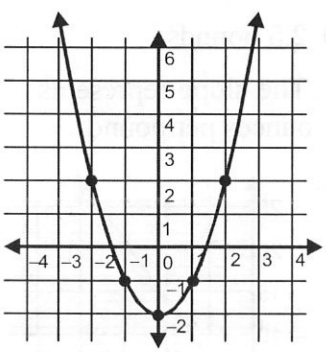

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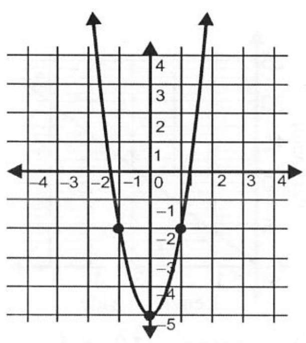

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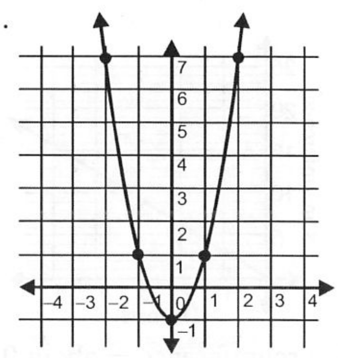

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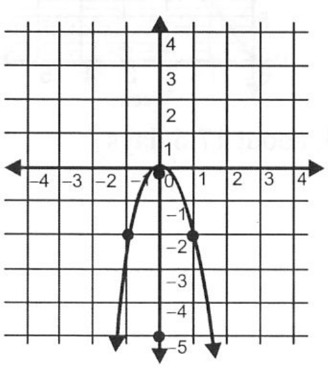

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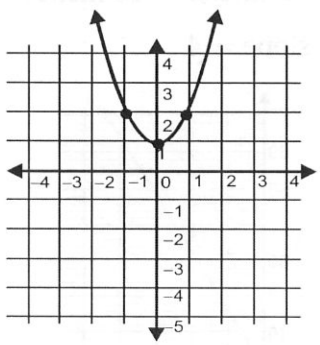

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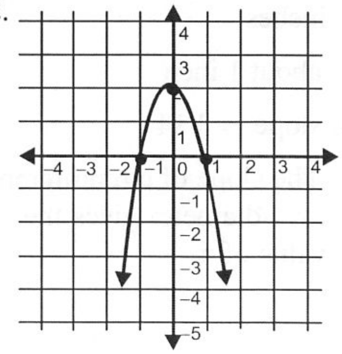


Page 157 Solving Word Problems with Systems of Equations

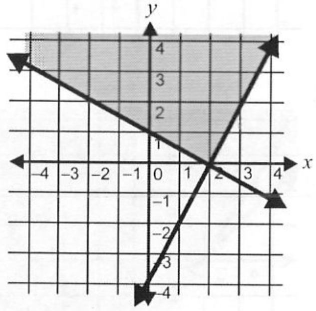
1. 90, 120 2. 42, 84 3. 9 times 4. 122 5. 45

Chapter 12 Review

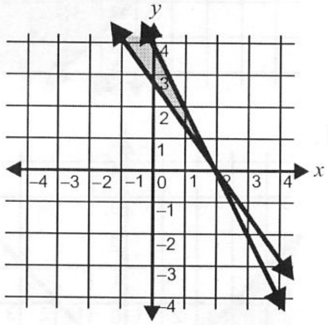
Page 158

1. $(1,-1)$
2. $(1,0)$
3. $(0,-1)$
4. $(2,2)$
5. $(-3,0)$
6. $(-6,-15)$
7. $(2,0)$
8. $(5,-1)$
9. $(-3,4)$
10. $(1,\frac{3}{4})$
11. $(\frac{15}{2},4)$
12. $(5,\frac{7}{3})$

13.



14.



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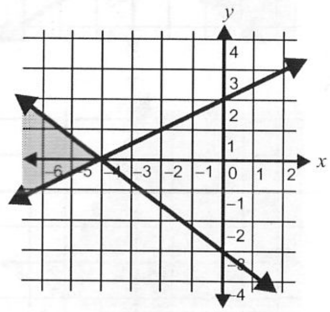

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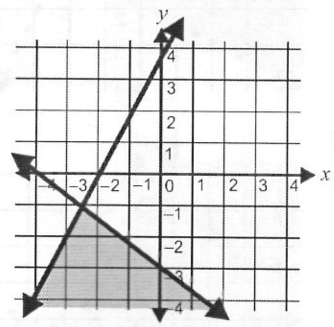

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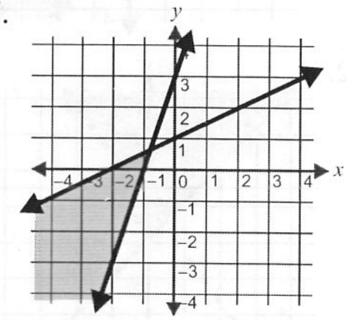
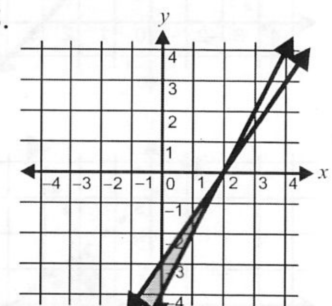


18.



19. 72 \$10's, 13 \$5's 20. 40 tickets 21. 1 time 22. \$0.80

Chapter 13 Relations and Functions

Page 159 Relations

1. Domain: $\{2,9,3,6\}$
   Range: $\{5,12,8,7\}$
2. Domain: $\{12,3,7,26\}$
   Range: $\{4,12,19\}$
3. Domain: $\{4,7,16,5\}$
   Range: $\{3,14,34,11\}$
4. Domain: $\{2,33,98,43,67\}$
   Range: $\{45,43,9,61,54\}$
5. Domain: $\{78,29,84,16,98\}$
   Range: $\{14,67,49,18,46\}$
6. Domain: $\{-8,23,-4,16,-3\}$
   Range: $\{16,-7,-9,-8,6\}$
7. Domain: $\{-7,-3,-4,-6,-8\}$
   Range: $\{-4,16,17,-8,12\}$
8. Domain: $\{-1,3,-7,-2,-6\}$
   Range: $\{-2,6,14,8,2\}$
9. Domain: $\{0,-8,3,-8,7\}$
   Range: $\{9,5,12,-3,18\}$
10. Domain: $\{58,44,74,6,63\}$
    Range: $\{14,97,32,18,44\}$

Chapter 12 Systems of Equations and Systems of Inequalities

Page 151 Slopes of Collinear, Parallel, and Intersecting Lines

1. parallel
2. parallel
3. collinear
4. intersecting
5. collinear
6. intersecting
7. intersecting
8. collinear
9. parallel
10. intersecting
11. parallel
12. intersecting
13. parallel
14. collinear
15. intersecting
16. parallel
17. intersecting
18. collinear
19. intersecting
20. intersecting

Page 153 Solving Systems of Equation by Substitution

1. $(4, 2)$
2. $(-2, 3)$
3. $(3, -1)$
4. $(4, 5)$
5. $(3, 5)$
6. $(2, 2)$
7. $(\frac{1}{2}, \frac{1}{3})$
8. $(2, 1)$
9. $(0, 1)$
10. $(0, -1)$
11. $(-1, 3)$
12. $(1, 1)$
13. $(0, 1)$
14. $(0, -1)$
15. $(3, 0)$

Page 155 Solving Systems of Equations by Adding or Subtracting

1. $(28, -10)$
2. $(2, -3)$
3. $(4, 5)$
4. $(3, 10)$
5. $(6, 2)$
6. $(2, 2)$
7. $(\frac{3}{2}, 1)$
8. $(1, 4)$
9. $(0, 1)$
10. $(3, 1)$
11. $(-1, 3)$
12. $(2, -4)$
13. $(0, 1)$
14. $(2, -1)$
15. $(3, 0)$

Pages 166–167 Relations That Can Be Represented By Functions

1. 4,044 atoms
2. 5 milligrams
3. (A) 5,381,290
   (B) 3,591,580
4. (A) 2,726 bacteria
   (B) 56,569 bacteria
5. \$3,514.37
6. Bank 2

Page 169 Exponential Growth and Decay

1. $F(t) = 15(1.01)^t$

t	$F(t)$
1	15.15
2	15.30
3	15.45
4	15.61

exponential growth

3. $M(t) = 1000(1.04)^t$

t	$M(t)$
2	1081.60
4	1169.86
6	1265.32
8	1368.57

exponential growth

5. $C(t) = 5300(0.5)^t$

t	$C(t)$
5	165.63
10	5.18
15	0.16
20	0.01

exponential decay

2. $S(t) = 350(0.85)^t$

t	$S(t)$
1	297.50
3	214.94
5	155.30
7	112.20

exponential decay

4. $B(t) = 2(2.50)^t$

t	$B(t)$
1	5.00
2	12.50
3	31.25
4	78.13

exponential growth

6. $R(t) = 80\left(\frac{1}{3}\right)^t$

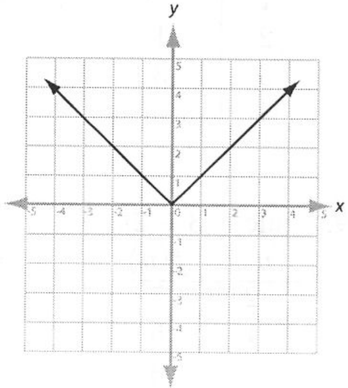
t	$R(t)$
2	8.89
4	0.99
6	0.11
8	0.01

exponential decay

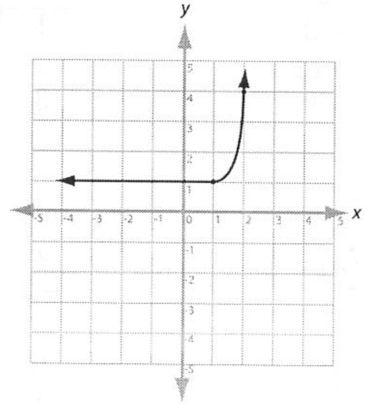
7. Town B is experiencing decay. Town A is experiencing growth.
8. population
9. The graph represents population, and population cannot be negative.
10. year 8

Page 171 Step Functions

1.



2.



Chapter 14 Patterns

Page 174 Number Patterns

	Sequence	Pattern	Next Number	20th number in the sequence
1.	$-2, -1, 0, 1, 2$	$n-3$	3	17
2.	$5, 6, 7, 8, 9$	$n+4$	10	24
3.	$3, 7, 9, 11, 15, 19$	$4n-1$	23	79
4.	$-3, -6, -9, -12, -15$	$-3n$	-18	-60
5.	$3, 5, 7, 9, 11$	$2n+1$	13	41
6.	$2, 4, 8, 16, 32$	2^n	64	$1,048,576$
7.	$1, 8, 27, 64, 125$	n^3	216	$8,000$
8.	$0, -1, -2, -3, -4$	$1-n$	-5	-19

Page 175 Inductive Reasoning and Patterns

1.(A) Expect 80 visitors in the fifth week.
(B) Expect $5 \times 2^{n-1}$ visitors in the nth week.
(C) It will take 8 weeks to get over 500 visitors in one week.

2. Predict $4,000$ in 2009.

3. Predict 1,464 in 2000 (1.1 times 1999 scores)

4. Each week the increase in height is $\frac{1}{2}$ what it was the week before, so the April 29 reading would be $22.5 + .75 = 23.25$ inches.

5. Each week the decrease in height is $\frac{1}{2}$ the previous week's, so the temperature at 2:00 would be 32 degrees and at 2:15 would be 30 degrees.

Page 177 Inductive Reasoning and Patterns

1.(A) 19 posts
(B) $n+1$
(C) 310 feet

2.(A) $300 + 10n$
(B) $300 + 40n$
(C) 30 months
(ten 3-month periods)

3.(A) $100 + 2n$
(B) 50 pair

4. $40 + 4(n - 50)$

Page 178 Using Problem Solving Skills

1. 29

2. 26

3. 19

Chapter 14 Review

Page 179

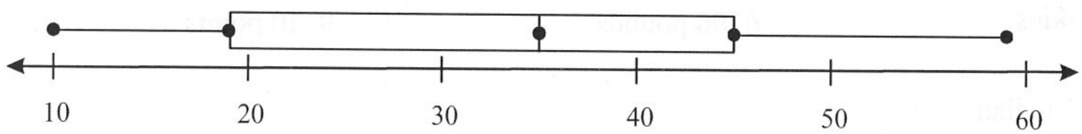
1. $n - 1$
2. 19
3. $2n - 1$
4. 49
5. $3n$
6. 90
7. $4.95 + 0.95n$
8. 15 hours
9. $22n$
10. 14 batches
11. 378

Page 185 Quartiles and Extremes

	lower extreme	lower quartile	median	upper quartile	upper extreme
1.	0	1	2	3	5
2.	15	16	20	22	23
3.	62	76	81	89	94
4.	74	74	76	77	78
5.	3	4	6	7	8
6.	190	191	192	195	196
7.	6	8	10	12	15
8.	21	23	26	30	35

Page 186 Box-and-Whisker Plots

1.



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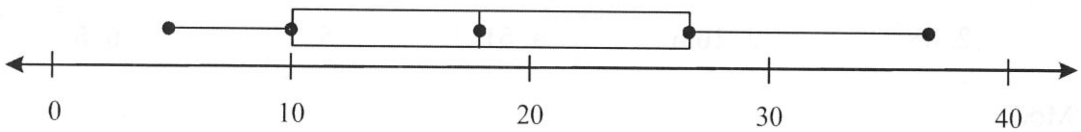


Page 188 Scatter Plots

1. no relationship
2. negative
3. no relationship
4. positive
5. positive
6. negative

Page 189 The Line of Best Fit

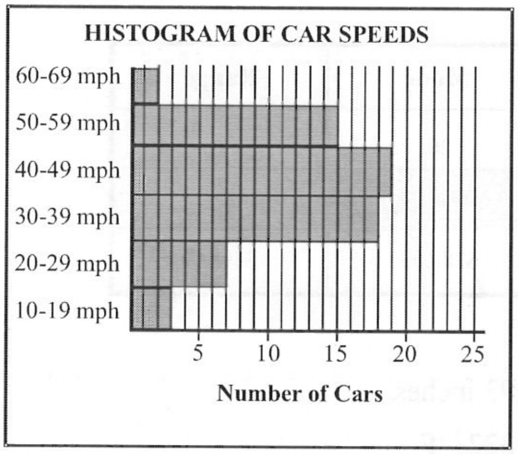
1. A = about $5,500
2. H = about 450 ft
3. HPV = about $175,000

Page 191 Misleading Statistics

1. Graph B is misleading because the y-axis does not begin at 0.
2. 5
3. 2
4. 2
5. mean
6. median
7. Yes, the mean is affected by an outlier if one teenager purchases 58 games. The outlier inflates the average number of games purchased per teenager.
8. Graph A is misleading because it does not start at 0.

Pages 194–195 Histograms

1.



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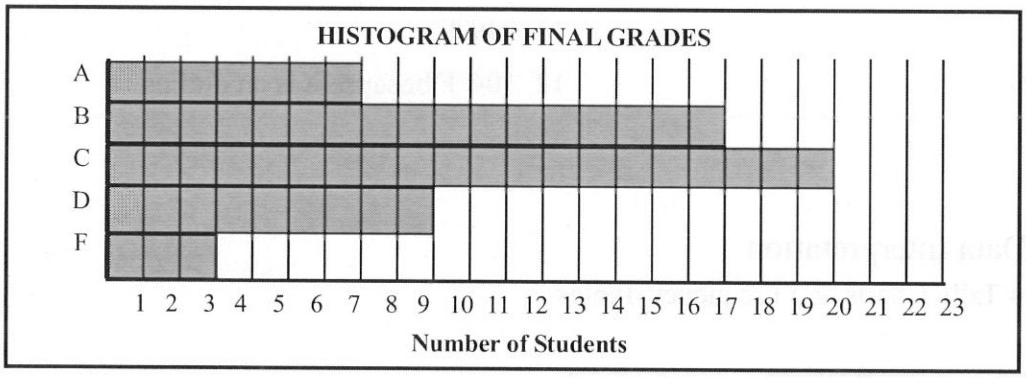


Page 195 Bar Graphs

1. China
2. 3
3. 800 Million
4. India
5. 30
6. 7
7. C
8. 96
9. 52

Page 196 Circle Graphs

1. $16
2. $20
3. $40
4. $4
5. 300
6. 150
7. 280
8. 50
9. 150
10. 70

Page 208 Tree Diagrams

1. $\frac{5}{64}$
2. $\frac{4}{25}$
3. $\frac{10}{81}$
4. $\frac{3}{50}$
5. $\frac{1}{6}$
6. $\frac{10}{121}$
7. $\frac{3}{25}$
8. $\frac{2}{49}$
9. $\frac{1}{12}$
10. $\frac{1}{9}$
11. $\frac{4}{225}$
12. $\frac{1}{16}$
13. $\frac{1}{8}$
14. $\frac{2}{9}$
15. $\frac{1}{8}$

Page 210 Simulations

1.(A) $\frac{101}{250}$
 (B) $\frac{3}{8}$
 (C) $\frac{14}{125}$
 (D) $\frac{1}{8}$
 (E) Yes

2.(A) $\frac{1}{3}$
 (B) $\frac{1}{6}$
 (C) $\frac{7}{50}$
 (D) the simulation accurately portrays rolling a six-sided cube

Page 211 Intersection of Sets

1. {Jan, Dan}
2. {purple}
3. $\{2, 4, 6, 8, 10\}$
4. {a, e, i}
5. {maple}
6. $\{98, 95\}$
7. {orange}
8. $\{7, 2\}$
9. $\{2\}$
10. $\{6, 2\}$
11. $\{2, 9\}$
12. $\{2\}$
13. {Phil}
14. $\emptyset$
15. {Kate}
16. $\emptyset$
17. {Jan}

Page 212 Union of Sets

1. {apples, pears, oranges, bananas}
2. $\{5, 10, 15, 20, 25, 30, 40\}$
3. {Ted, Steve, Kevin, Michael, George, Kenny}
4. {raisins, prunes, apricots, peanuts, almonds, coconut}
5. {sales, marketing, accounting, receiving, shipping}
6. {beef, pork, chicken, tuna, shark}
7. $\{1, 2, 3, 4, 5, 6, 7, 8\}$
8. $\{1, 4, 5, 6, 7, 8, 9\}$
9. $\{1, 2, 3, 4, 5, 6, 9\}$
10. $\{1, 2, 3, 4, 5, 6, 7, 8, 9\}$
11. {Carol, Mike, Jill, Jack, Fred, Kate, Bill}
12. {Carol, Mike, Jack, Fred, Jill, Lamar, Bill}
13. {Jack, Kate, Bill, Jill, Lamar, Fred}
14. {Carol, Mike, Jill, Jack, Fred, Kate, Bill, Lamar}

Page 219 More Permutations

1. 1,680
2. 60
3. 116,280
4. 40,320
5. 95,040
6. 55,440
7. 1,320
8. 992
9. 15,600

Page 220 Combinations

1. 15
2. 310,124
3. 1,140
4. 28
5. 210
6. 53,130
7. 1,001
8. 66

Page 221 More Combinations

1. 48
2. 280
3. 96
4. 90
5. 120
6. 36
7. 60

Chapter 18 Review
Page 222

1. 5,040
2. 792
3. 792
4. 60
5. 45
6. 180
7. 5,040
8. 288
9. 300
10. 190

Chapter 19 Time Problems

Page 223 Converting Units of Time

1. 6 years 6 months
2. 5 hours 24 minutes
3. 2 minutes 16 seconds
4. 4 weeks 1 day
5. 2 weeks 3 days
6. 4 minutes 20 seconds
7. 6 hours 15 minutes
8. 6 days 7 hours 18 minutes
9. 6 weeks 2 days 12 hours
10. 2 hours 56 minutes 26 seconds
11. 13 hours 27 minutes 27 seconds
12. 8 years 1 month

Page 224 Adding Units of Time

1. 18 hours 5 minutes
2. 5 hours 5 minutes
3. 1 week 4 days 6 hours
4. 9 minutes 15 seconds
5. 13 years 5 months
6. 1 week 3 days 9 hours 28 minutes
7. 4 weeks 1 day
8. 6 years
9. 1 hour 23 minutes 7 seconds
10. 22 hours 11 minutes

Page 228 Two-Step Time Problems

1. 3:15 p.m.	3. 3:20 p.m.	5. 5:15 p.m.	7. 3:00 p.m.	9. 6:50 p.m.
2. 2:15 p.m.	4. 3:45 p.m.	6. 3:20 p.m.	8. 5:25 p.m.	10. 1:15 p.m.

Page 229 Calculating Starting Times

1. 12:45 p.m.	3. 5:15 p.m.	5. 9:50 a.m.	7. 10:25 a.m.	9. 4:25 p.m.	11. 2:35 p.m.
2. 3:35 p.m.	4. 1:50 p.m.	6. 1:40 p.m.	8. 12:45 p.m.	10. 7:20 p.m.	12. 1:30 p.m.

Page 230 Calculating Hours

1. $7\frac{3}{4}$ hours	3. $7\frac{2}{3}$ hours	5. $1\frac{5}{6}$ hours	7. $7\frac{1}{3}$ hours	9. $7\frac{3}{4}$ hours	11. $6\frac{1}{2}$ hours
2. $4\frac{1}{2}$ hours	4. $2\frac{3}{4}$ hours	6. $8\frac{1}{6}$ hours	8. $1\frac{5}{6}$ hours	10. $6\frac{1}{4}$ hours	12. $\frac{5}{6}$ hours

Chapter 19 Review
Page 231

1. $2\frac{5}{12}$ hours	3. 11:10 a.m.	5. 10 months	7. 1:45 p.m.	9. 12:50 p.m.
2. 2:15 p.m.	4. $7\frac{1}{4}$ hours	6. 3:05 p.m.	8. $3\frac{2}{3}$ hours	10. $3\frac{1}{12}$ hours

Chapter 20 Measurement

Page 233 Approximate English Measure

1. C	2. F	3. E	4. G	5. E	6. G	7. D	8. B	9. F	10. A

Page 235 Estimating Metric Measurements

1. B	3. A	5. C	7. D	9. D	11. A	13. B
2. A	4. D	6. A	8. C	10. B	12. C	14. C

Page 236 Converting Units within the Metric System

1. 0.035 g	8. 2.5 cg	15. 0.723 mm
2. 6,000 m	9. 17,500 mL	16. 3 L
3. 0.0215 L	10. 0.0042 kg	17. 5,060 mg
4. 0.49 cm	11. 6 dL	18. 0.1058 cL
5. 5,350,000 mL	12. 41,700 cg	19. 4.3 km
6. 0.0000321 kg	13. 0.182 L	20. 205.7 cm
7. 0.1564 km	14. 812 cm	21. 0.5643 kg

Page 246 Finding the Missing Leg of a Right Triangle

1. 12
2. 8
3. 9
4. 24
5. 60
6. $10\sqrt{7}$
7. 4
8. 36
9. 84

Page 248 Applications of the Pythagorean Theorem

1. 70.71 feet
2. 258.14 feet
3. 41.23 yards
4. 22.36 yards

Page 250 Special Right Triangles

1. 8
2. $\frac{9\sqrt{2}}{2}$
3. 7
4. $\sqrt{3}$
5. $3\sqrt{3}$
6. 10
7. $a = \frac{1}{3}$ $\quad b = \frac{\sqrt{3}}{3}$
8. $a = \frac{4}{5}$ $\quad b = \frac{4\sqrt{2}}{5}$
9. $a = \frac{2\sqrt{2}}{3}$ $\quad b = \frac{2\sqrt{2}}{3}$
10. $a = 2\sqrt{3}$ $\quad b = 3$
11. $a = 4\sqrt{3}$ $\quad b = 8\sqrt{3}$
12. $a = 16$ $\quad b = 8\sqrt{2}$

Page 252 Introduction to Trigonometric Ratios

1. $\sin A = \frac{4}{5} = 0.8$
   $\cos A = \frac{3}{5} = 0.6$
   $\tan A = \frac{4}{3} = 1.333$
   $\sin B = \frac{3}{5} = 0.6$
   $\cos B = \frac{4}{5} = 0.8$
   $\tan B = \frac{3}{4} = 0.75$

2. $\sin A = \frac{20}{29} = 0.690$
   $\cos A = \frac{21}{29} = 0.724$
   $\tan A = \frac{20}{21} = 0.952$
   $\sin B = \frac{21}{29} = 0.724$
   $\cos B = \frac{20}{29} = 0.690$
   $\tan B = \frac{21}{20} = 1.05$

3. $\sin A = \frac{9}{41} = 0.220$
   $\cos A = \frac{40}{41} = 0.976$
   $\tan A = \frac{9}{40} = 0.225$
   $\sin B = \frac{40}{41} = 0.976$
   $\cos B = \frac{9}{41} = 0.220$
   $\tan B = \frac{40}{9} = 4.444$

4. $\sin A = \frac{8}{17} = 0.471$
   $\cos A = \frac{15}{17} = 0.882$
   $\tan A = \frac{8}{15} = 0.533$
   $\sin B = \frac{15}{17} = 0.882$
   $\cos B = \frac{8}{17} = 0.471$
   $\tan B = \frac{15}{8} = 1.875$

5. $\sin A = \frac{3\sqrt{10}}{10} = 0.949$
   $\cos A = \frac{\sqrt{10}}{10} = 0.316$
   $\tan A = 3$
   $\sin B = \frac{\sqrt{10}}{10} = 0.316$
   $\cos B = \frac{3\sqrt{10}}{10} = 0.949$
   $\tan B = \frac{1}{3} = 0.333$

6. $\sin A = \frac{\sqrt{3}}{2} = 0.866$
   $\cos A = \frac{1}{2} = 0.5$
   $\tan A = \sqrt{3} = 1.732$
   $\sin B = \frac{1}{2} = 0.5$
   $\cos B = \frac{\sqrt{3}}{2} = 0.866$
   $\tan B = \frac{\sqrt{3}}{3} = 1.732$

Chapter 21 Review
Pages 256–257

1. 48°
2. 4 cm
3. 7.81
4. 12
5. 5
6. 30°
7. $-45°$ or $315°$
8. $\angle B = 51°$, $b = 3.705$, $c = 4.767$
9. $\angle B = 45°$, $a = 6$, $c = 8.485$
10.(A) 1.265 mi
 (B) 18.435°
11. $d = 437$ yards
12. V
13. C
14. S
15. V
16. S
17. S
18. E
19. S
20. I
21. S
22. I
23. C
24. C
25. V

Chapter 22 Plane Geometry

Page 259 Perimeter

1. 26 in
2. 17 ft
3. 168 cm
4. 38 cm
5. 44 in
6. 32 in

Page 260 Area of Squares and Rectangles

1. 100 ft^2
2. 10 cm^2
3. 36 in^2
4. 180 in^2
5. 36 ft^2
6. 50 cm^2
7. 8 ft^2
8. 40 in^2
9. 144 ft^2
10. 84 cm^2
11. 8 ft^2
12. 42 cm^2

Page 261 Area of Triangles

1. 6 in^2
2. 36 cm^2
3. 21 ft^2
4. 72 cm^2
5. 3 ft^2
6. 160 cm^2
7. 52.5 m^2
8. 31.5 in^2
9. 2 ft^2
10. 12 ft^2
11. 75 ft^2
12. 15 m^2

Page 262 Area of Trapezoids and Parallelograms

1. 132 in
2. 48 in
3. 18 in
4. 170 cm
5. 154 in
6. 60 cm
7. 78 in
8. 120 cm
9. 56 cm

Page 270 Area of a Circle

1. 78.5 in^2, $78\frac{4}{7}$ in^2
2. 200.96 ft^2, $201\frac{1}{7}$ ft^2
3. 50.24 cm^2, $50\frac{2}{7}$ cm^2
4. 28.26 m^2, $28\frac{2}{7}$ m^2
5. 18 ft, 254.34 ft^2, $254\frac{4}{7}$ ft^2
6. 2 in, 12.56 in^2, $12\frac{4}{7}$ in^2
7. 16 cm, 200.96 cm^2, $201\frac{1}{7}$ cm^2
8. 10 ft, 314 ft^2, $314\frac{2}{7}$ ft^2
9. 28 m, 615.44 m^2, 616 m^2
10. 9 cm, 254.34 cm^2, $254\frac{4}{7}$ cm^2
11. 24 ft, 452.16 ft^2, $452\frac{4}{7}$ ft^2
12. 3 in, 28.26 in^2, $28\frac{2}{7}$ in^2

Page 271 Area of Sectors

1. $\frac{1}{12}$
2. $\frac{1}{180}$
3. $\frac{2}{45}$
4. $\frac{13}{90}$
5. $\frac{1}{8}$
6. $\frac{1}{5}$
7. $\frac{1}{3}$
8. $\frac{3}{4}$
9. $\frac{1}{24}$
10. $\frac{3}{10}$
11. $\frac{1}{6}$
12. $\frac{1}{4}$
13. 7.85 cm^2
14. 65.4 in^2
15. 56.52 cm^2
16. 3.49 ft^2

Page 273 Two-Step Area Problems

1. 525 ft^2
2. 112 in^2
3. 452 cm^2
4. 73 ft^2
5. 422 in^2
6. 12.5 m^2
7. 2,500 cm^2
8. 216 m^2

Page 275 Geometric Relationships of Plane Figures

1. 4 times larger
2. 2 times larger
3. 4 times larger
4. 9 times larger
5. 25
6. $3x$
7. 8
8. 2 in by 2 in

Chapter 22 Review
Page 276

1. 170 in^2
2. 20 in
3. $P = 16$ ft, $A = 12$ ft^2
4. $C = 6.28$ ft, $A = 3.14$ ft^2
5. 64 in^2
6. 60, 45°
7. 66 cm^2
8. $C = 44$ cm, $A = 154$ cm^2
9. $\overleftrightarrow{A}$
10. 4 times larger

Page 286 Surface Area of Cones

1. $15.7\ \text{cm}^2$
2. $68.69\ \text{in}^2$
3. $2{,}703.54\ \text{mm}^2$
4. $264.61\ \text{yd}^2$
5. $176.63\ \text{ft}^2$
6. $56.52\ \text{m}^2$

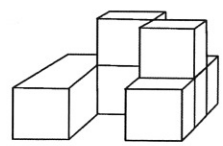
Page 291 Using Nets To Find Surface Area

1. $54\ \text{in}^2$
2. $131\ \text{cm}^2$
3. $502.4\ \text{cm}^2$
4. $518\ \text{ft}^2$
5. $17.53\ \text{cm}^2$
6. $15.072\ \text{cm}^2$

Page 292 Solid Geometry Word Problems

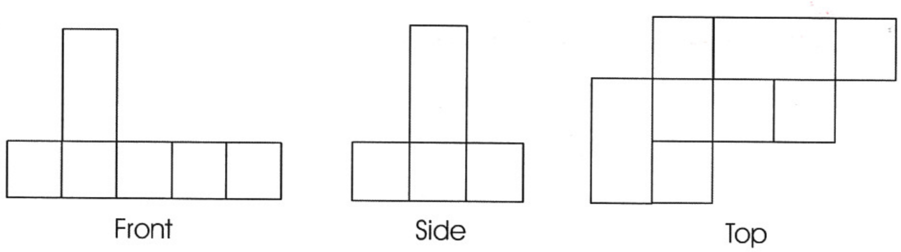
1. $V = 25,000,000\ \text{yd}^3$
2. $V = 9.42\ \text{ft}^3$
3. $V = 7,234.56\ \text{cm}^3$
4. $V = 5.23\ \text{in}^3$
5. $V = 5,184\ \text{in}^3$
6. $SA = 250\ \text{cm}^2$
7. $SA = 207.24\ \text{ft}^2$
8. $SA = 756\ \text{cm}^2$
9. $SA = 24\ \text{ft}^2$, $V = 8\ \text{ft}^3$

Page 294 Front, Top, Side, and Corner Views of Solids Objects

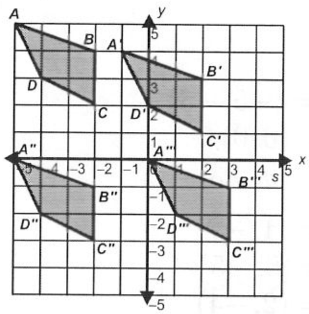
1. B
2. C
3. A
4. 

Chapter 23 Review
Pages 295–296

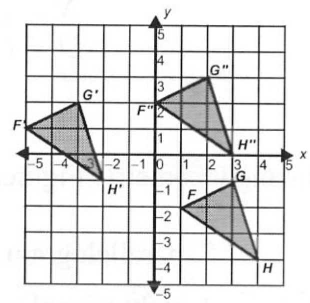
1. $V = 18\ \text{cm}^3$, $SA = 42\ \text{cm}^2$
2. $V = 3,080\ \text{in}^3$, $SA = 1,188\ \text{in}^2$
3. $V = 48\ \text{m}^3$, $SA = 96\ \text{m}^2$
4. $V = 56.52\ \text{ft}^3$
5. $56\ \text{m}^3$
6. $1{,}437\frac{1}{3}\ \text{in}^3$, $SA = 616\ \text{in}^2$
7. $36{,}000\ \text{in}^3$
8. 512
9. 8 times larger
10. $64\ \text{in}^3$
11. $50.24\ \text{in}^3$
12. $2{,}750\ \text{ft}^3$
13. $2{,}200\ \text{cm}^2$
14. $52\ \text{ft}^2$
15. 1,728 one-inch cubes
16. $80\ \text{in}^3$
17. $1{,}518\ \text{m}^3$

18\. 

Page 304 Translations



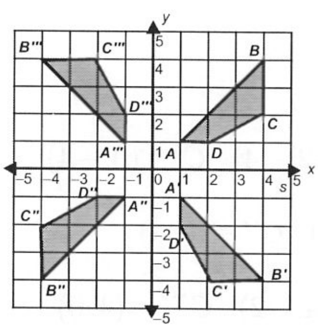
1. $A' = (-1, 4)$ $B' = (2, 3)$ $C' = (2, 1)$ $D' = (0, 2)$
2. $A'' = (-5, 0)$ $B'' = (-2, -1)$ $C'' = (-2, -3)$ $D'' = (-4, -2)$
3. $A''' = (0, 0)$ $B''' = (3, -1)$ $C''' = (3, -3)$ $D''' = (1, -2)$

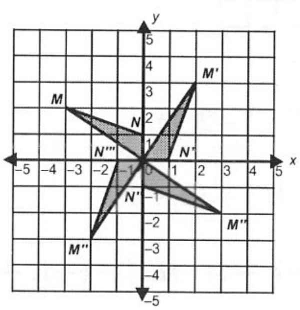


4. $F' = (-5, 1)$ $G' = (-3, 2)$ $H' = (-2, -1)$
5. $F'' = (0, 2)$ $G'' = (2, 3)$ $H'' = (3, 0)$

Page 305 Rotations

1. $A' = (1, -1)$ $C' = (2, -4)$
   $B' = (4, -4)$ $D' = (1, -2)$
2. $A'' = (-1, -1)$ $C'' = (-4, -2)$
   $B'' = (-4, -4)$ $D'' = (-2, -1)$
3. $A''' = (-1, 1)$ $C''' = (-2, 4)$
   $B''' = (-4, 4)$ $D''' = (-1, 2)$

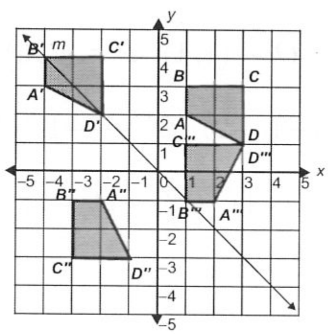




4. $M' = (2, 3)$ $N' = (1, 0)$
5. $M'' = (3, -2)$ $N'' = (0, -1)$
6. $M''' = (-2, -3)$ $N''' = (-1, 0)$

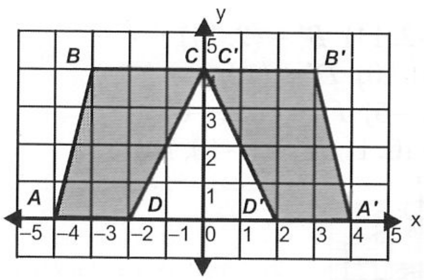
Page 306 Transformation Practice

1. $A' = (-4, 3)$ $C' = (-2, 4)$
   $B' = (-4, 4)$ $D' = (-2, 2)$
2. $A'' = (-2, -1)$ $C'' = (-3, -3)$
   $B'' = (-3, -1)$ $D'' = (-1, -3)$
3. $A''' = (2, -1)$ $C''' = (1, 1)$
   $B''' = (1, -1)$ $D''' = (3, 1)$

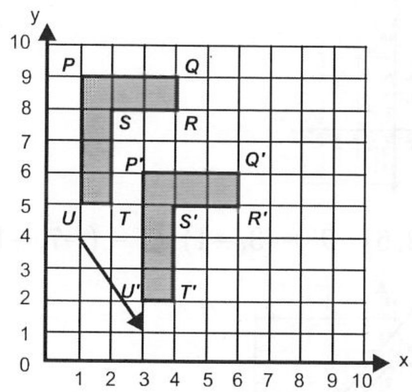


Chapter 24 Review
Pages 309–310

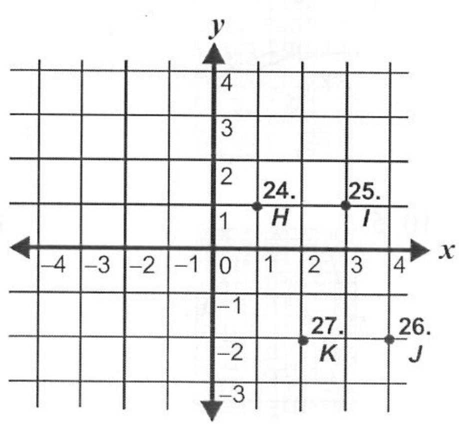
1.



2. $(4, 0)$
3. $(3, 4)$
4. $(0, 4)$
5. $(2, 0)$
6.



7. $(3, 6)$
8. $(6, 6)$
9. $(6, 5)$
10. $(4, 5)$
11. $(4, 2)$
12. $(3, 2)$
13. A
14. $(6, 8)$, $(12, 20)$, $(-6, 10)$
15. $(3, \frac{5}{2})$, $(2, \frac{5}{2})$, $(\frac{3}{2}, \frac{7}{2})$
16. $(-12, \frac{21}{2})$, $(-3, \frac{21}{2})$, $(-\frac{9}{2}, \frac{9}{2})$, $(-9, \frac{9}{2})$
17. $(-4, 4)$
18. $(-4, 2)$
19. $(-1, 2)$
20. $(-2, -2)$
21. $(1, -2)$
22. $(1, -3)$
23. $(-2, -3)$
24. see graph below
25. see graph below
26. see graph below
27. see graph below
28. parallelogram

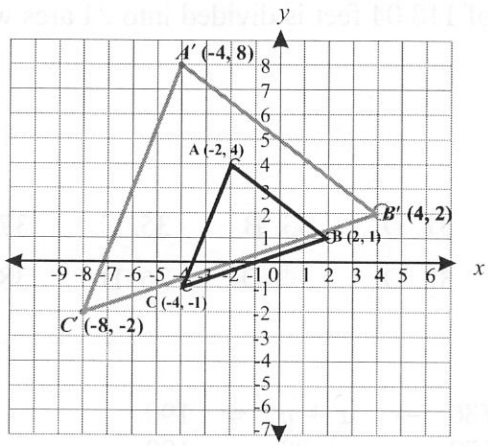


Segment 4

61. D	64. B	67. D	70. B	73. B	76. C	79. C	82. D	84. $\frac{11}{50}$
62. B	65. C	68. B	71. C	74. A	77. D	80. B	83. A	
63. C	66. D	69. A	72. C	75. B	78. D	81. B		

85.(A) To find the image of the points, multiply the x and y-coordinates by the scale factor 2.

(B)



Practice Test 2

Pages 331–349

Segment 1

1. A	3. D	5. B	7. A	9. C	11. B	13. B	15. B	17. B	19. A
2. B	4. D	6. D	8. B	10. D	12. D	14. C	16. D	18. A	

20.(A) $V = \frac{1}{3}lwh$

(B) $V = \frac{1}{3}(4)(4)(2) = 10\frac{2}{3}$ cubic yards

Segment 2

21. B	23. A	25. A	27. B	29. D	31. B	33. D	35. C	37. A	39. 30%
22. A	24. C	26. A	28. A	30. B	32. C	34. B	36. B	38. 2	

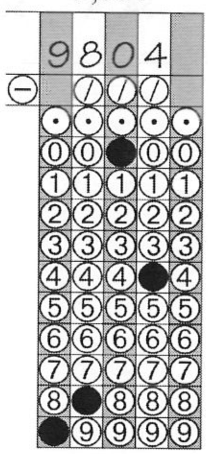
40.(A)

Week Number	Number of words	Number of minutes	Words per minute
1	610	53	11.5
2	890	53	16.8
3	810	42	19.3
4	770	32	24.1
5	1420	46	30.9
6	1490	42	35.5

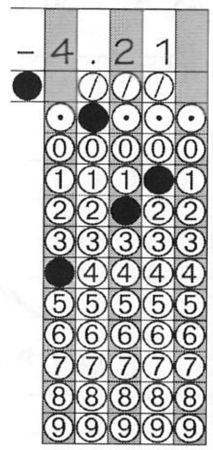
Directions for a Gridded Response Problem

1. Solve the problem.
2. Write the answer in the boxes of the grid.
    - Write only one digit or one symbol in a box.
    - Write the decimal point or fraction bar in the answer box if it is part of the answer.
    - Mixed numerals must be change to improper fractions or decimals.
    - Do not leave spaces between digits or symbols.
    - Do not include commas.
3. Fill in the correct bubble under each box in which you wrote a number or symbol.
4. The examples below show numbers correctly gridded.

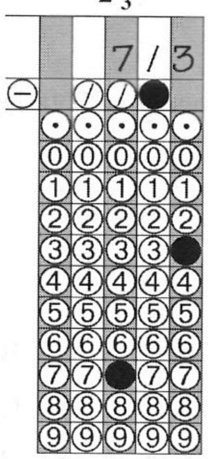
9,804



– 4.21



$2\frac{1}{3}$



$-\frac{1}{2}$